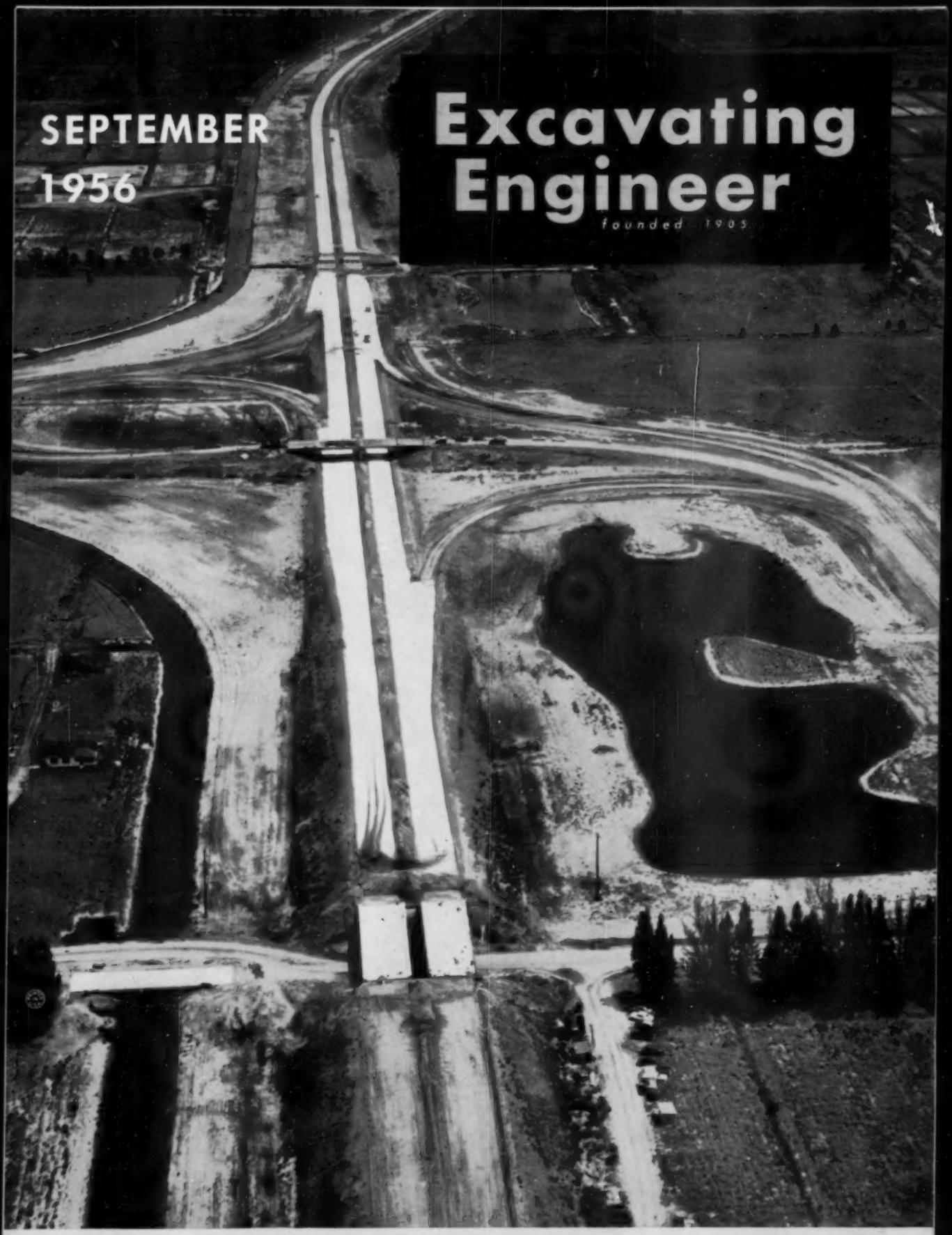
SEPTEMBER
1956

Excavating Engineer

founded 1905



Florida's bobtail turnpike—a 108.1-mile section of the Sunshine State Parkway extending from Fort Pierce to Miami—rapidly is taking shape. It is scheduled to be opened January 1. Pictured is the interchange at Delray under construction. Please turn to page 22.

In Wisconsin . . . and the World Over

ROCK MEN RELY ON BUCYRUS-ERIE

The Sign of Profitable Production

A 4½-cu. yd. Bucyrus-Erie 110-B loads unusually hard granite and quartz in a Northern Wisconsin quarry.

Economical handling of heavy, abrasive rock, like the granite and quartz shown here, requires an extra margin of performance from the excavator assigned to the job.

In this Wisconsin quarry, as on rock jobs the world over, men who know quarry shovels rely on Bucyrus-Eries. They expect and receive the extra workability you need for profitable production. Reason: Bucyrus-Erie design and construction advantages have long been proved, as evidenced by the thousands of contractors using Bucyrus-Eries on every type of excavating operation.

For example, there's the extra strong yet light front end for steady, high output on the toughest job. There's responsive Ward Leonard electric control for fast acceleration and deceleration, speeded-up work cycles. Laboratory controlled, heavy-duty construction keeps maintenance costs low, adds greatly to machine life.

We will be happy to supply you with full information on this outstanding line of rock shovels.

85L56C

GLOBAL APPROVAL
UNITED STATES · VENEZUELA · ALGERIA · CANADA · CONGO · ENGLAND · FINLAND · FRANCE · INDO-CHINA · MOROCCO · PHILIPPINES · RHODESIA
110-B 4½-cu. yd.
150-B . . 6-cu. yd.
190-B . . 8-cu. yd.
BUCYRUS ERIE

Bucyrus-Erie Company

South Milwaukee, Wisconsin

toughest

Royal Blue rope is made of the *toughest* rope wire ever developed... Roebling Type 1105

John A. Roebling's Sons Corporation, Trenton 2, N. J., Subsidiary of The Colorado Fuel and Iron Corporation BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1723 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6.

"Far as I'm concerned the CAT* No. 12 Grader is it!"

—Chas. M. Loser, Supt., Kiely Construction Co.
Butte, Montana

During the summer of 1955, Kiely Construction Co. completed a $238,000 job of rebuilding 7.15 miles of secondary road between Stevensville and Florence, Mont. Excavation and borrow on the project amounted to more than 220,000 cu. yd.

Pictured here is one of Kiely's Caterpillar No. 12 Motor Graders, leveling fill on the 32-foot subgrade of the roadway. This No. 12 was purchased late in 1950 and has worked well over 6000 hours. Says Superintendent Loser: "As far as I'm concerned the Cat No. 12 is *it!* They never give us a bit of trouble."

Long, trouble-free life is a common characteristic of Caterpillar Motor Graders. And when you're ready to trade them in you can count on high resale value. Old Cat No. 12s don't wear out. They just keep on doing their job somewhere else. Over 99% of all the Cat Graders ever built are still at work!

The present No. 12 has all the built-in ruggedness of earlier machines, and the same excellent job visibility, ease of blade positioning, accuracy and operator comfort. But in addition it gives you a 115 HP Caterpillar Diesel Engine and other new features. There's an exclusive *oil clutch* that runs up to 1500 hours without adjustment; *tubeless tires* that eliminate tube and flap trouble and reduce tire down time, at no extra cost; and in-cab starting—optional direct electric or gasoline engine.

Your Caterpillar Dealer not only sells these big yellow machines but backs them up with reliable parts and service. Let him show you what the new No. 12 can do, right on one of your own jobs.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE

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Excavating Engineer

founded 1905

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BPA Member

Here's what you need to know about Cables for Bridges, Towers, Aerial Tramways

Bethlehem has just published a new and comprehensive handbook devoted to the uses of wire rope and strand in bridges, towers, aerial tramways, etc. This 160-page book is filled from cover to cover with practical information and interesting photographs. There are also drawings showing structural and anchorage details, and various types of sockets and clips. All in all, the book has more than 200 illustrations.

SEND FOR FREE COPY. A copy is yours for the asking. No charge, of course. Simply address your request to Publications Dept., Bethlehem Steel Company, Bethlehem, Pa.

And when you have questions on cables and fittings, please feel free to consult personally with our engineers. These technicians are very close to the subject; they live with it and work with it every day. You'll find them friendly and cooperative, and always interested in helping you solve your problems.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Bethlehem makes bridge strand and bridge ropes in all the popular sizes. Moreover, our Williamsport plant has prestretching facilities for handling any length of strand or rope that can be manufactured and shipped.

BETHLEHEM STEEL

What is the Crane Combination YOU need?

NORTHWEST Crane Equipment is so designed as to meet any crane problem you may have. There is a wide range of boom hoist equipment. Mast-type gantry with the sectional boom hoist rigging and pendent lines make possible ease of adjustment to boom length changes. You have a choice of two or three sheaves at the boom point. Adjustable jib, telescopic boom struts, removable counterweight, extended boom point sheave shaft for piledriver leads—all can be had to meet your requirements. And, if you need long crawlers and wide treads, they're available.

STANDARD BOOM HOIST

The Northwest Standard Boom Hoist is a self-locking worm gear boom hoist running in an oil bath and it operates under power both up and down. It is safe, smooth, positive!

INDEPENDENT HIGH-SPEED BOOM HOIST

The Northwest Independent High-Speed Boom Hoist is independent of all other operations and permits booming with power controlled lowering without sacrificing either of the main drums. It is a rugged, heavy-duty unit capable of hour in and hour out operation. There is no finer, more reliable hoisting assembly.

THIRD DRUM

The Northwest 3rd Drum operates independently of the main drums and is fitted with its own clutch and brake. It makes possible 3 load lines with a standard worm boom hoist; and 3 load lines with the independent high-speed boom hoist.

NORTHWEST ENGINEERING COMPANY
1506 Field Building • 135 South LaSalle Street, Chicago 3, Illinois

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957 · AMERICAN ROAD BUILDERS ASSOCIATION

PRODUCTION PLUS · $ · MEANS MONEY

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

TS-18 "Eucs"

TWIN-POWER SCRAPERS get more work done... *faster*

Twin-Power—two engines driving separate axles—was pioneered by Euclid 10 years ago. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power matched to any job condition. The TS-18 is powered by two 218 h.p. engines with a 300 h.p. engine for the tractor available for work where maximum power can be used. Standard tires are 27.00 x 33 with 33.5 x 33 as optional. Harris Construction Company's "Twins" are TS-18 Specials with 518 h.p. and the larger tires.

With a total of 518 h.p.—300 h.p. in the tractor and 218 h.p. in the scraper—Harris' TS-18 Specials really made the dirt fly and completed the Glasgow Air Force Base grading weeks ahead of schedule.

Harris Construction Co. of Aberdeen, S. D. recently set a new record for earthmoving on Montana highway work with a fleet of six TS-18 Euclid Scrapers. In a six-day work week these "Eucs" moved 90,000 cu. yds. on a half million yd. road contract near Nashua on Route 2. They worked 10 hours a day—self loaded gravel, clay and shale without pusher tractors—on hauls averaging 1500 ft. Most of the time each machine worked alone making shallow cuts and fills on sections of the 13-mile job.

At nearby Glasgow Air Force Base, Harris used his original fleet of four TS-18 "Eucs" to move most of the 1,200,000 yds. of gumbo. Working two 10-hour shifts 6 days a week, each scraper averaged 69,000 yds. a month. Performance of the "Twins" on this air base job was so outstanding that 2 more were added to the Euclid fleet—and Harris has disposed of 8 other scrapers and 5 crawler tractors.

With two jobs only 26 miles apart the mobility and independence of the TS-18 Scrapers proved a big advantage. They moved from air base to road job and back again—as conditions required—in about an hour. There was no problem or expense in moving pusher tractors because none were needed at either job. And when a few loads of sand or gravel were needed for culverts or other use, a "Twin" or two took off for the nearest pit and did the job in a hurry.

Owner Ken Harris has found the Twin-Power Scraper the most efficient dirt mover he's ever used. His fleet with job availability of 95% has more than lived up to his expectations in production and low cost yardage. That's why he tells visitors to his jobs, "When I buy additional haulage equipment it'll be TS-18 'Eucs' ".

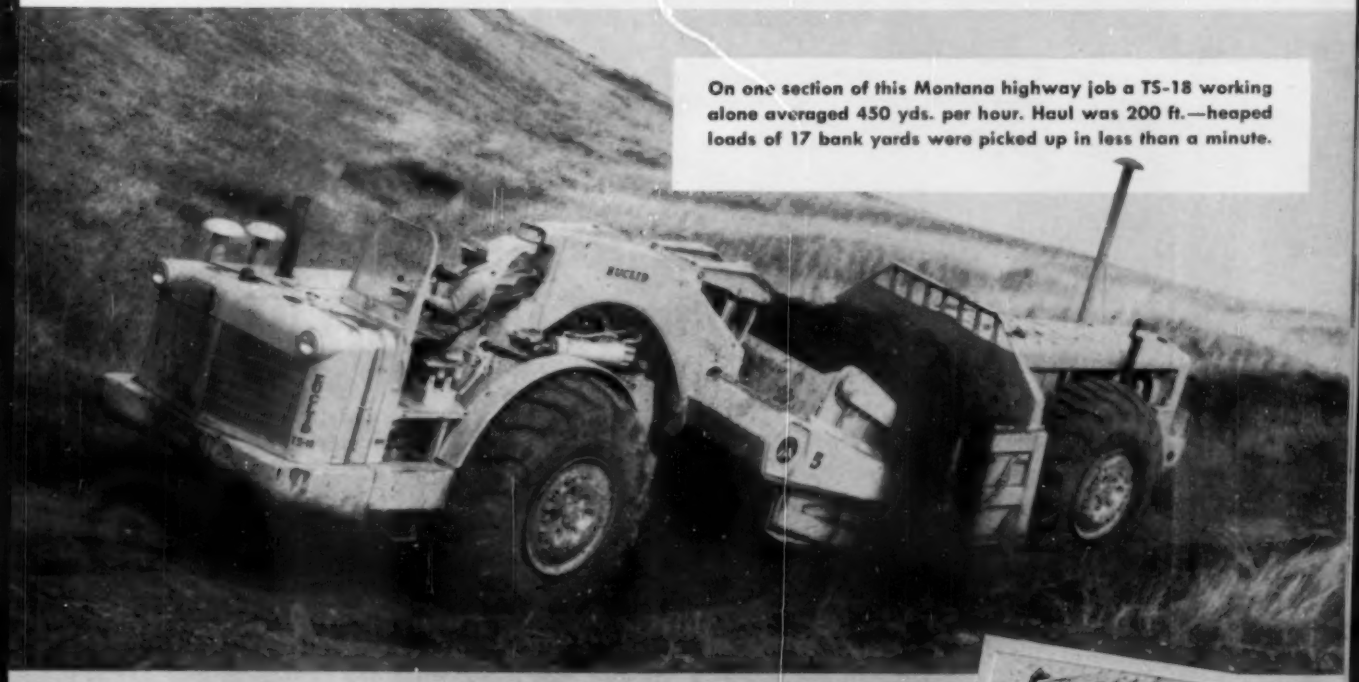
For information on the complete line of Euclid earthmoving equipment, call your Euclid dealer—he can show you why ***Euclids are your best investment.***

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA ·
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957
AMERICAN ROAD BUILDERS ASSOCIATION

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

set new earthmoving records

. . . complete tough jobs way ahead of schedule



On one section of this Montana highway job a TS-18 working alone averaged 450 yds. per hour. Haul was 200 ft.—heaped loads of 17 bank yards were picked up in less than a minute.

The 33.5 x 33 tires and NoSpin differentials of the TS-18 Specials provided the tremendous traction needed for self-loading the heavy gumbo and gravel and made efficient use of the 518 total h.p. on both of the Montana jobs.

Ken Harris, head of Harris Construction Co. in South Dakota, says "the complete independence of the 'Twin' is revolutionizing road building on many jobs where concentration of equipment in any single cut is not practical." He's standardized on the TS-18 Special for his earth-moving equipment.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

CHICAGO

the most IMPORTANT PLACE for the Construction Industry in 1957

A.R.B.A. ROAD SHOW and CONVENTION,

International Amphitheatre, Jan. 28 to Feb. 2, 1957

Here in Chicago everything is being done to make the coming A.R.B.A. Road Show and Convention an event that will be remembered for its value as an instructive conference, a helpful equipment show and its pleasures. Chicago's vast hotel setup is being organized to care for the large attendance that will be present. The International Amphitheatre is the largest exhibit hall in the Country and will provide an ideal spot for gathering and viewing the over 1,000 pieces of equipment that will be shown.

The Stock Yards Inn with its many eating places and cocktail lounges, and the cafeterias in the Amphitheatre, assure comfortable restaurant facilities.

Free Bus Service from the main hotels will assure adequate transportation and permit attending convention sessions regularly and at the same time allow you to spend time at the show.

Add to all this the many attractions that Chicago always provides.

Remember the place—the date—and make your plans. Ask to be put on the list to receive future information on the 1957 Road Show and Convention.

AMERICAN ROAD BUILDERS' ASSOCIATION

World Center Building Washington 6, D. C.

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · AMERICAN ROAD BUILDERS' ASSN. ARBA 1902

MONARCH WHYTE STRAND is available in the right size and type for today's faster, higher output construction equipment.

A thousand and one types and sizes of MONARCH WHYTE STRAND are designed and constructed to give you high quality Wire rope for all your needs.

When you work wire rope like this MONARCH WHYTE STRAND pays off in service!

PREformed MONARCH WHYTE STRAND meets the needs of your equipment—with flexibility, strength, and abrasion resistance!

There's no guesswork involved in getting the rope you need for scrapers, draglines, shovels or any other equipment. Any Macwhyte distributor can supply your needs from a thousand and one types and sizes of MONARCH WHYTE STRAND. These are supplied Internally Lubricated and PREformed, in Lang Lay or Regular Lay, with Independent Wire Rope Core or Fiber Core.

There are correct MONARCH WHYTE STRAND Wire Ropes for all equipment. Give this rope an opportunity to serve you—you will be more than pleased with its performance.

MACWHYTE WIRE ROPE

Macwhyte Company, 2903 Fourteenth Avenue, Kenosha, Wis.

Ask for Booklet 5325 "Wire Rope Recommendations for Contractors' Equipment"

Manufacturers of: Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies.

MILL DEPOTS:
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Pittsburgh 19, 704 Second Ave.
Chicago 6, 228 So. Desplaines St.
Detroit 3, Oakman Blvd.
St. Paul 14, 2356 Hampden Ave.
Ft. Worth 1, P. O. Box 605
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San Francisco 7, 188 King St.
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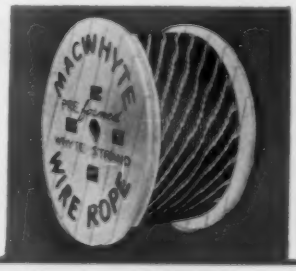
Distributors conveniently located throughout the United States



Properly PREformed and Internally Lubricated MONARCH WHYTE STRAND has the strength, flexibility and resistance to abrasion that means maximum efficiency under toughest service conditions.

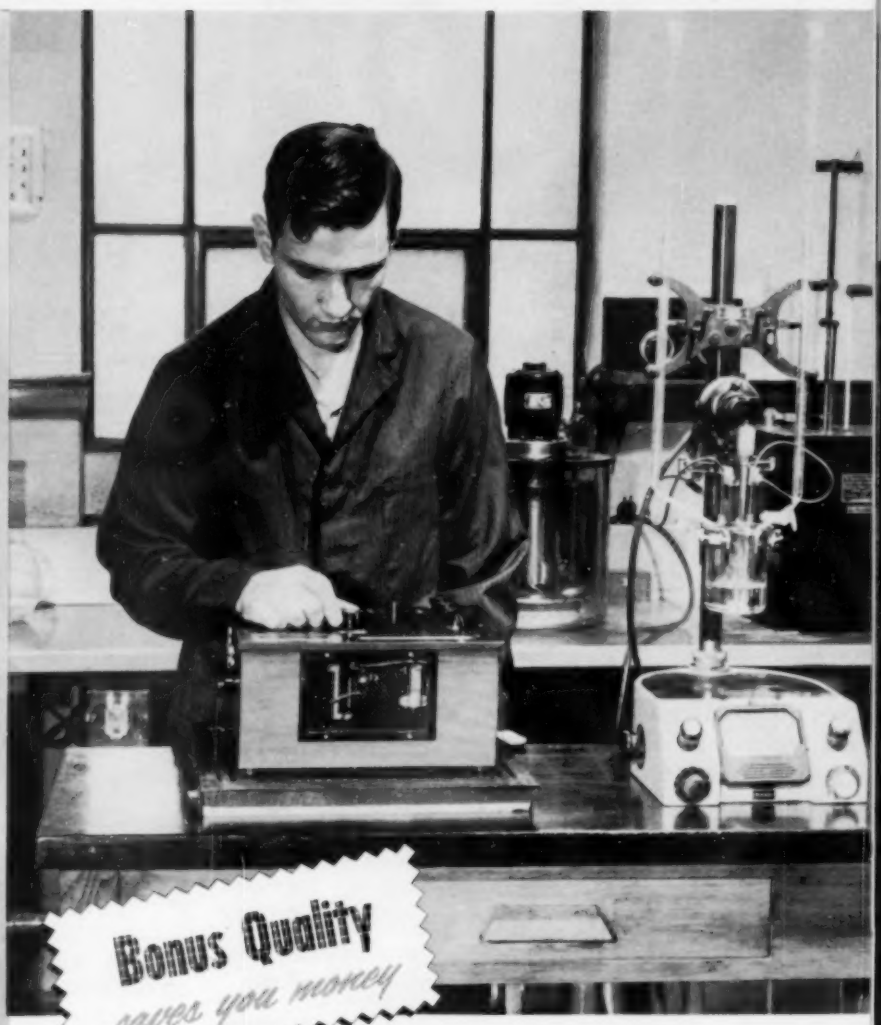
Whether you need rope for scrapers, draglines, shovels, dozers, etc.—you'll find the Rope you need recommended in Booklet 5325. Ask for your free copy from your Macwhyte distributor.

How Bucyrus-Erie

Not far from Portland, Maine, a 22-B Transit Crane handles concrete bucket during construction of the Maine Turnpike extension.

Smallest convertible excavator in the Bucyrus-Erie line is the ⅜-yd. 10-B, shown here cutting a road through a hill to a dam site near Barre, Vt.

Bucyrus-Eries are a familiar sight on turnpike projects. This 2-yd. 51-B is cutting down high ground for the Garden State Parkway in New Jersey.



Bonus Quality *saves you money*

For chemical analysis of steel and other materials, Bucyrus-Erie's laboratory has the finest scientific equipment, including the spectrophotometer shown here. This apparatus analyzes the elements in steel by measuring the degree to which a steel solution absorbs certain waves of light. The exact amount of each element present can be determined by this extremely sensitive instrument.

This 15-B ½-yd. dragshovel excavates for a street widening project in Shawano, Wis.

Equipped with a clamshell bucket this ¾-yd. 22-B moves dirt at the site of a new highway bridge at College Park, Md.

In the wilderness of Washington's Olympic National Park, a 1½-yd. 38-B shovel works on an access road.

Quality Control

Helps You Earn More Dollars

From the time molten metal is ready for pouring castings until the day a machine is shipped, Bucyrus-Erie's laboratory keeps a vigilant watch over the manufacturing process. The laboratory, rivaling those of companies specializing in metal production, won't let any part through until it passes all specified tests. Let's take a look at what happens to steel:

Each lot of steel undergoes standard metallurgical tests to ascertain if our rigid specifications have been met and where conditions warrant it photo-micrographs are made to permit a study of the grain structure. After steels have been subjected to various heat-treating processes, they are selectively tested for tensile strength, yield point, compression resistance, hardness, and ductibility. A quench-testing machine assists in determining the hardenability of various steels. Only after they meet ALL specifications are they allowed to go into Bucyrus-Erie machines.

Such close attention to details pays off for you on the job through more efficient operation . . . longer life. For the full story on these profit-builders, write, see, or call your nearby Bucyrus-Erie distributor. He will be glad to help you select the right Bucyrus-Erie for your work.

213E56C

BUCYRUS ERIE

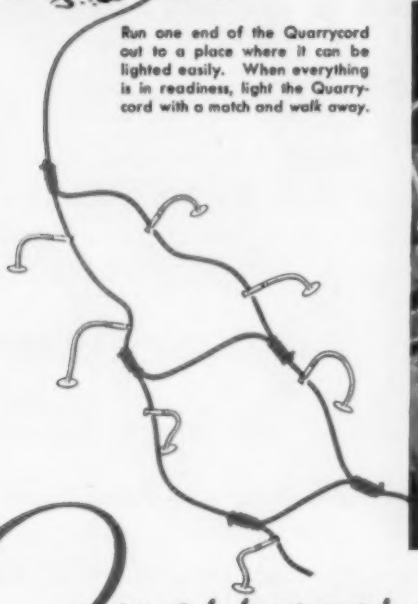
SOUTH MILWAUKEE, WISCONSIN

This 4-yd. 88-B excavates rock in turnpike construction near Blanford, Mass.

On the Kentucky Turnpike, a 54-B dragline with 60-ft. boom and 3-yd. bucket loads dirt into bottom-dump trailer.

On the Indiana Turnpike this 3-yd. 71-B dragline clears away sand and peat near East Gary.

Run one end of the Quarrycord out to a place where it can be lighted easily. When everything is in readiness, light the Quarrycord with a match and walk away.



Quarrycord

(PLEASE GIVE THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN)

for one-shot lighting of safety fuse in secondary blasting

Now you can ignite each and every safety fuse from *one point*, and eliminate the hazard of men climbing over the rock pile, lighting each fuse individually.

Now you can have the advantage of fuse blasting, so that the holes go "pop-pop-pop" rather than "BOOM" — to reduce the noise of a single blast.

Now you can fire when convenient, without fear of stray electrical currents causing premature blasts.

Quarrycord is a flexible, water-resistant cord which burns with an external flame at the rate of about one foot per second.

It is very easy to use: (1) Prepare each primer cartridge in the usual way with safety fuse and detonating cap. (2) On the end of the fuse opposite the cap place a Quarrycord Connector. (3) Load and tamp the holes. (4) When ready to blast, run a line of Quarrycord so as to connect with each hole (5) At each fuse, pass the Quarrycord into the slot in the end of the connector and press the "lid" down *tight* over it to make positive contact. (6) If your hook-up has parallel lines of Quarrycord, make frequent cross connections as shown.

Quarrycord is packed on spools in 500 foot lengths, two spools to a box. Connectors are supplied in cardboard boxes containing 100 each.

For more information
see your Explosives Supplier, or write to

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut

Manufacturers of Primacord® Detonating Fuse, Safety Fuse, Ignitacord®, Blasting Accessories.

Established 1836

Free Folder **tells the whole story: what it does, and how to use it. Every Blaster should have a copy — send for it today.**

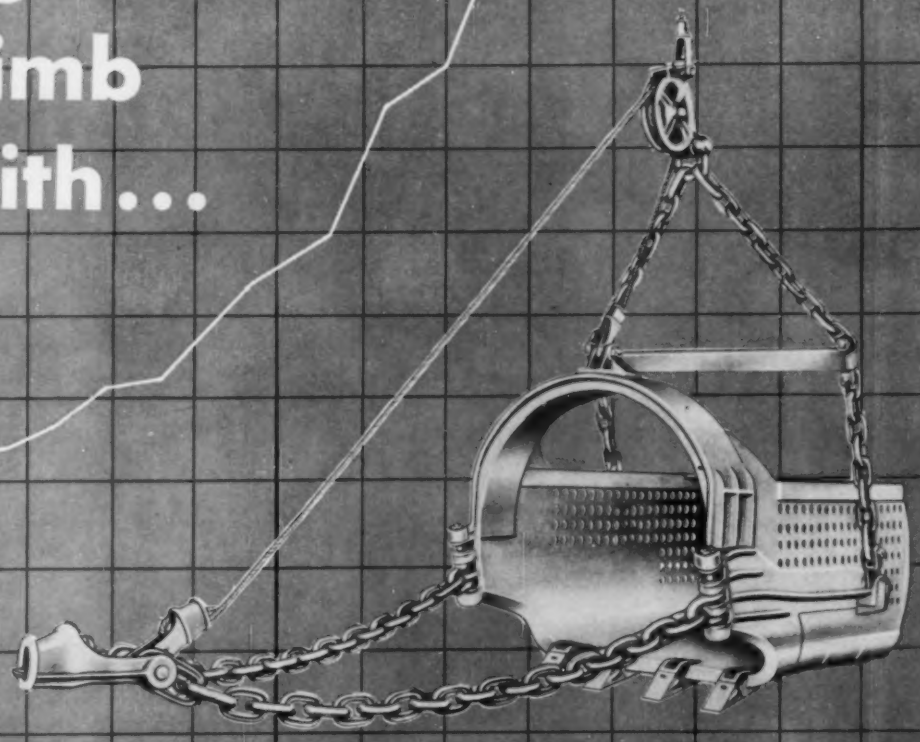
ENSIGN-BICKFORD

Quarrycord

for lighting Safety Fuse in Secondary Blasting

Q-4

watch production figures climb with...



HENDRIX DRAGLINE BUCKETS

A TYPE FOR EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

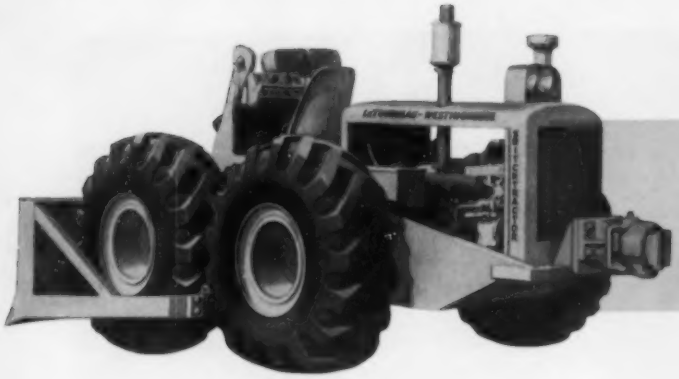
All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

Hendrix Lightweight DRAGLINE BUCKETS

See you at the ROAD SHOW — CHICAGO
Jan. 28-Feb. 2, 1957



new switch for old rig!

SwitchTractor

Now . . . time-tested Tournatractor

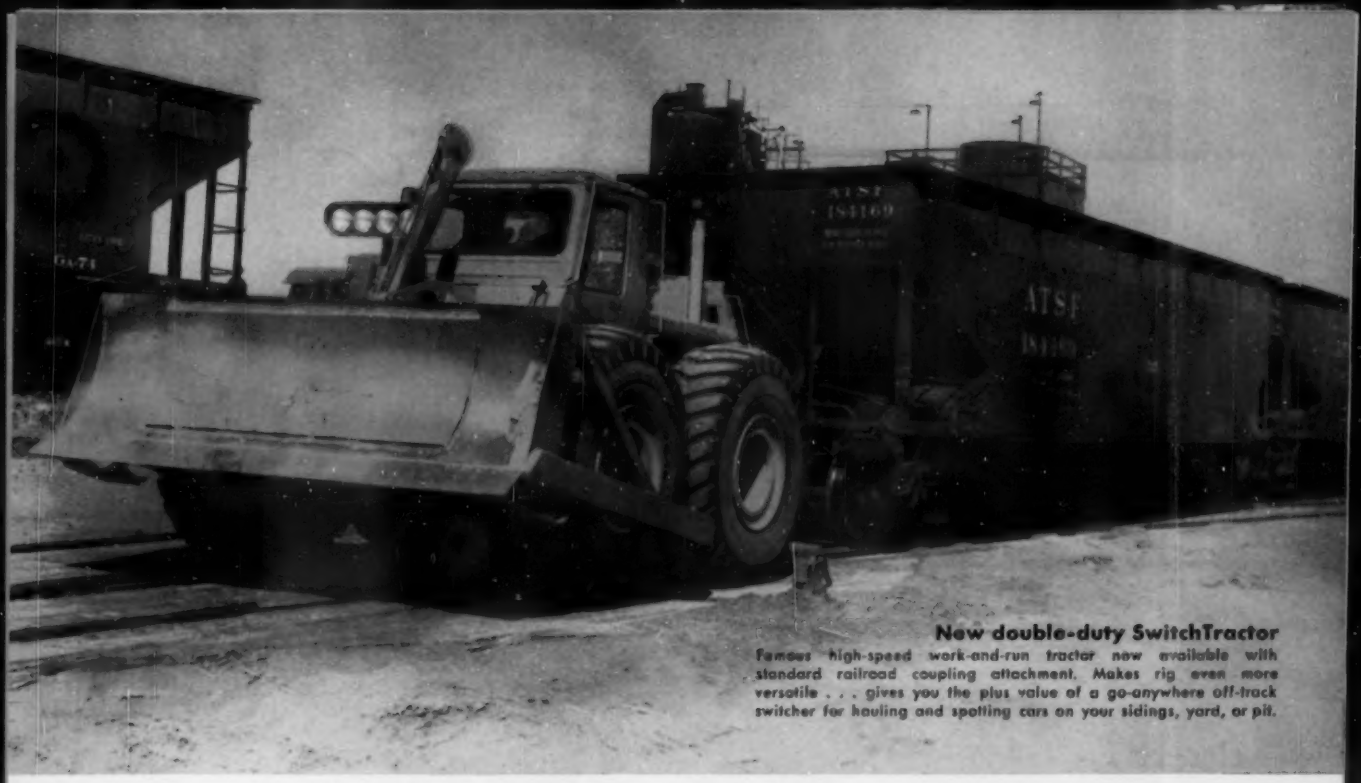
When not needed for spotting or hauling rail-cars, fast-moving, double-duty SwitchTractor drives anywhere around pit or plant on dozing, maintenance, and clean-up chores.

Ten years' hard use has improved and perfected the fast, rubber-tired performance of this work-and-run Tournatractor. Thousands of these machines have proved their value in dozing, hauling, pushing, grading, scarifying, compacting, and snowplowing in practically every country of the world. Each year has seen many major improvements. Wherever speed and maneuverability are needed, these fast-moving rigs have given outstanding service.

Doubles value of Tournatractor

Now — with new *SwitchTractor* application — this versatile unit gives you added utility. Equipped with a standard railway coupler at the rear, SwitchTractor does double-duty on your location . . . switches freight cars on your siding, yard, or pit at a moment's notice. Rig has plenty of power and traction to pull and spot long trains of cars as needed, saving time and money.

SwitchTractor often eliminates the need for maintaining private switch engines and engineers . . . saves charges and delays for RR switch service. Your single SwitchTractor and operator may well handle all your scattered tractor-dozer work — plus whatever freight-



New double-duty SwitchTractor
Famous high-speed work-and-run tractor now available with standard railroad coupling attachment. Makes rig even more versatile . . . gives you the plus value of a go-anywhere off-track switcher for hauling and spotting cars on your sidings, yard, or pit.

also spots and switches freight cars

car switching is required! Highly maneuverable in close quarters, unit turns around in its own length.

Off-track travel cuts switching time

SwitchTractor gives you several important advantages. Rolling on big, low-pressure rubber tires, this go-anywhere rig always takes the shortest route to every switching or hauling assignment. No matter where it happens to be working, unit easily highballs across yards, fields, tracks, ties, ditches, embankments to its next assignment — without damage to machine or roadbed. In hauling cars, it straddles tracks . . . does not chamfer ties or damage switches.

Depending on the distance and number of cars to be spotted or hauled, SwitchTractor can either push (with its dozer or push-plate), or pull with its drawbar. Coupling to cars with drawbar at rear takes but a moment. Coupler is safe, sturdy, standard RR type.

60% vs 30% coefficient of friction

Rolling on big rubber tires over ballast and ties, instead of with steel wheels on steel rails, SwitchTractor develops much more coefficient of friction (60% compared to 30%) than track locomotives of *twice* its weight. That means you have plenty of tractive power for fast starts and stiff rail grades in hauling cars. When not needed for handling cars on your pit or yard tracks, SwitchTractor keeps working productively for you as a dozer or towing tractor.

Worthwhile savings with SwitchTractor

If you have freight cars to move on your siding, yard, or pit, the added versatility of this new SwitchTractor will really pay off for you. Get all the facts on how this coupling-equipped go-anywhere tractor can save thousands of dollars for you in equipment investments and manpower economies. Phone or write us for details and a demonstration in handling *your* type of work.

SwitchTractor—Trademark, Tournatractor—Trademark Reg. U.S. Pat. Off. ST-1075-M

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
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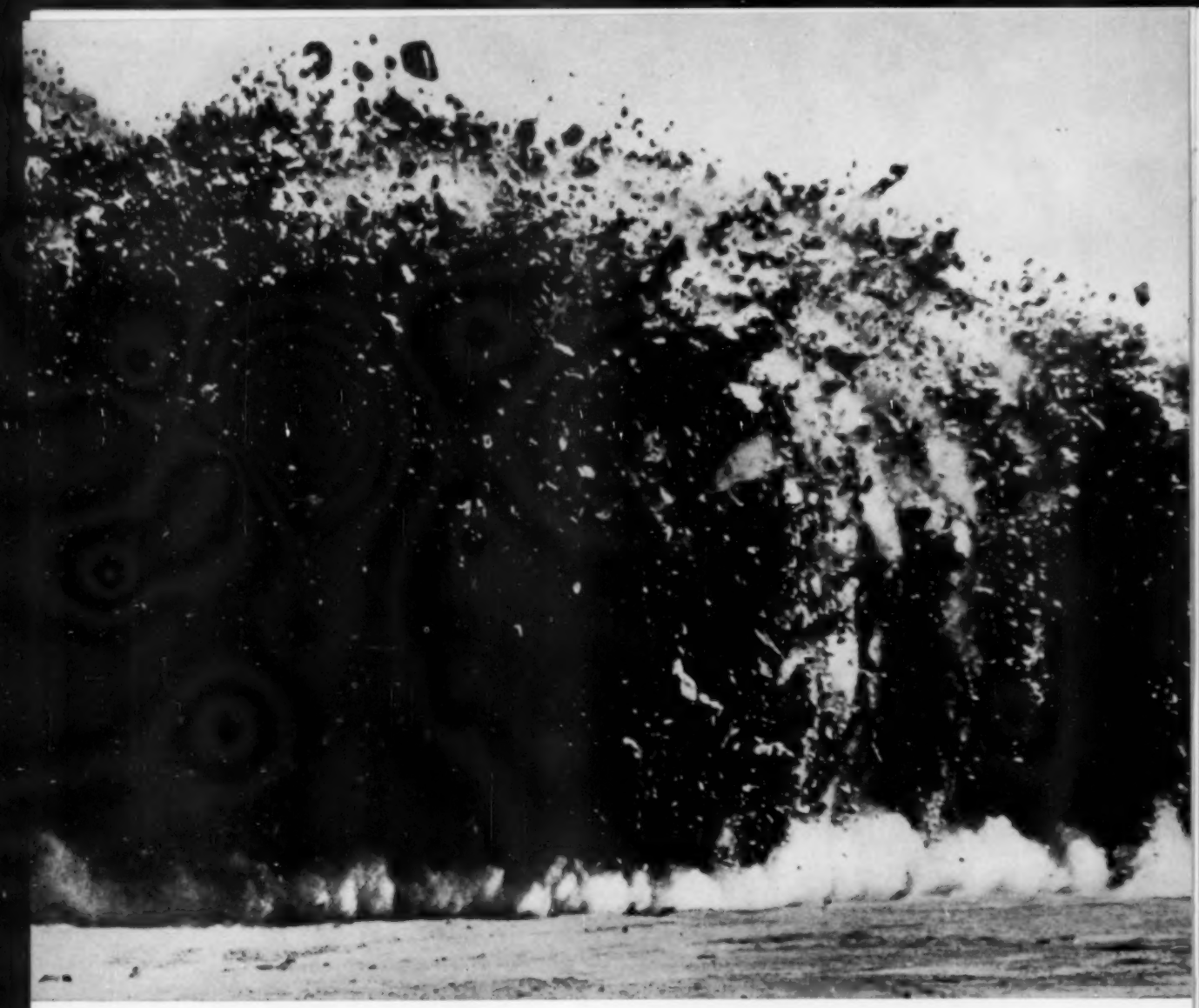

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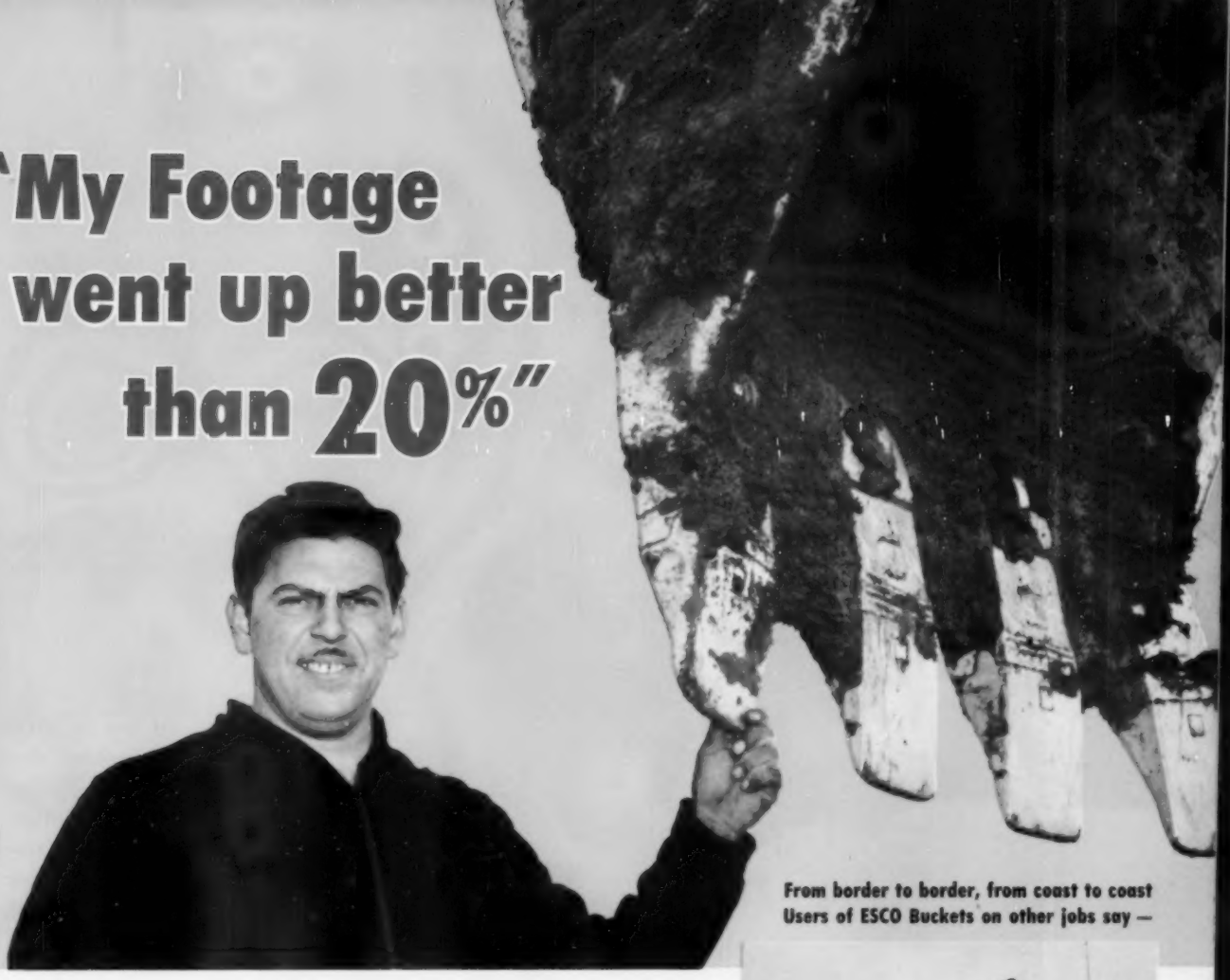

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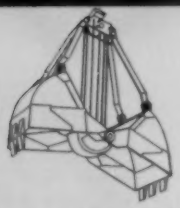

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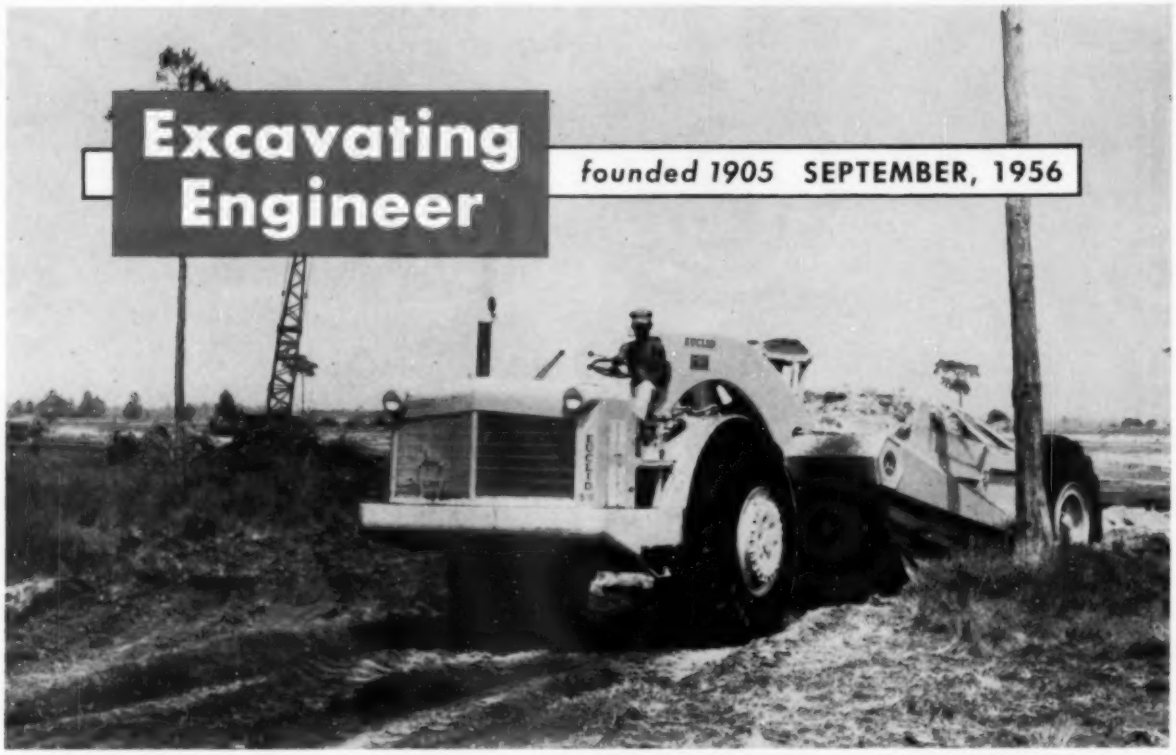
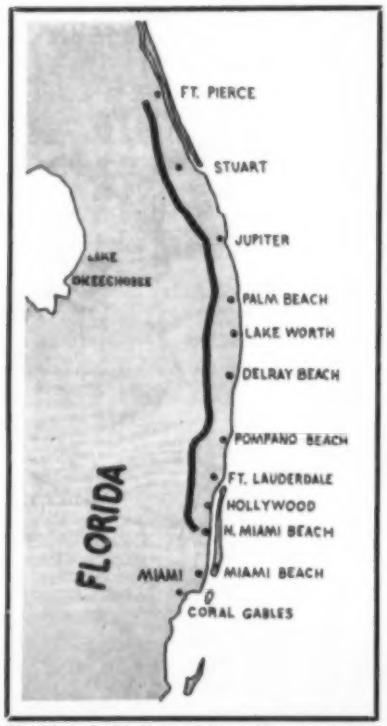


An 18-yd. scraper brings a load of material from borrow area to dump on a bridge approach on the Ralph Mills Co. project.

Florida's Economical Turnpike



Florida's bobtail turnpike will extend 108 miles from Miami north to Fort Pierce.

INVESTORS in revenue bonds for the 108.1-mile long bobtail section of Florida's Sunshine State Parkway may have good reason to smile when the toll road opens January 1.

Present indications are that the bobtail will be built at a savings of between $15 million and $17 million. A $74 million bond issue was floated for the project in June 1955. Final cost of the bobtail, despite the addition of a 5.9-mile section, is expected to be between $57 million and $59 million.

How They Saved

Sam P. Turnbull, chief engineer of the Florida State Turnpike Authority, advances several reasons for the anticipated savings:

1. Grading, drainage and fencing contracts were advertised in small parcels generally ranging from six to 10 miles. This allowed small contractors, many of them from Florida, to compete successfully for contracts. Lower prices were the result.

2. Florida's climate allows contractors to work the year round, enabling them to obtain full use of their equipment and to avoid costly down time because of inclement weather.

3. Because contracts were awarded for small sections of the turnpike to many contractors, work has proceeded rapidly.

4. A complete testing laboratory operated by the Turnpike Authority has resulted in a direct savings of more than $250,000 in construction costs.

5. A ready source of borrow material is provided by an existing canal paralleling much of the bobtail route and a canal being dug on the opposite side of the roadway for irrigation and drainage purposes.

The bobtail section of the Sunshine

Savings of between $15 million and $17 million may be realized in 108.1-mile bobtail section of the Sunshine State Parkway, which is scheduled to open January 1. Extension will be built.

State Parkway runs from Fort Pierce on Florida's east coast south to the Golden Glades Interchange in Dade County, six miles northwest of downtown Miami.

Originally, the Parkway was to have terminated at Hollywood Boulevard in West Hollywood (Broward County). Plans were revised, however, and the southern terminus was extended 5.9 miles at an increased cost of about $5 million.

With construction of the bobtail nearing its conclusion, dirt soon will begin to fly on the 279-mile long extension of the Sunshine State Parkway. The extension will run in a northerly and westerly direction from Fort Pierce to the St. Marys River, which separates Georgia and Florida, north of Jacksonville. Revenue bonds for $185 million will be issued during the fall for construction of the extension.

Links Large Cities

When the extension is completed, probably in mid-1958, the Sunshine State Parkway will be 388 miles long and will link three of Florida's four most populous areas—Miami in the south, Jacksonville in the north and Orlando in the central citrus belt. Future construction of a spur from a point on the existing turnpike west to Tampa, the state's third largest city, and St. Petersburg, is a possibility.

Need for a turnpike in Florida could be surmised by driving up U. S. Route 1, the speed-trapped and congested highway which links Miami and Jacksonville. The Sunshine State Parkway is being constructed to the west of U. S. 1.

Route 1 passes in many instances, especially in the southern part of the state, through or near business areas of rapidly-expanding cities and towns. Slow-moving traffic agonizes natives and also the increasing number of tourists who seek the state's warmth and sunshine.

Highway fatalities on U. S. 1 between Miami and Jacksonville in 1955 totalled 64, including 31 between Miami and Fort Pierce. Had the Miami-to-Fort Pierce section of the Sunshine Parkway been operating in 1955, 20 of the 31 persons who died on Route 1 in that section would still be alive, the Turnpike Authority calculates. Further, the Authority believes that 40 persons still would be alive had the entire Miami-to-Jacksonville turnpike been functioning last year.

Safety was necessarily an important consideration in the design of the Sunshine State Parkway. Some of the safety features on the bobtail section include:

1. Two 24-ft. wide roadways generally will be separated by a 20-ft. center divider or median strip.

2. No intersections will be at grade—the turnpike either will pass over or under crossroads. Twin bridges will carry the roadways over roads, canals and railroad tracks.

3. A 10-ft. wide hard shoulder will be provided on each side of the roadway. A 4-ft. wide hard shoulder will be at the left of each roadway.

4. The maximum grade will be 3%, except for the 3,000-ft. long bridge over the St. Lucie Canal, where 4½% grades will be used.

5. Curves will be held to a maximum of 1½°, providing a minimum sight distance of 725 feet.

The design speed is 70 mph, except at the terminal points (50 at the southern terminal and 30 on the remaining portions) and the St. Lucie Bridge (60 mph). Entrance ramps will have acceleration lanes 950 feet long. Deceleration lanes 475 feet long will be provided at exit ramps.

All structures will be of the deck type. Generally, they will have a 28-ft. wide roadway and 1½-ft. safety walks. The full median width will be maintained on all the structures, except the

One of two 54-B's on the Troup Bros. job, this machine is excavating a canal and dropping the material on the roadway.

St. Lucie Bridge, where the median space will be reduced to four feet. The top of the handrailing on structures will be below the level of drivers' eyes.

The turnpike pavement will be 2½ inches of plant-mixed asphaltic concrete —a 1½-in. binder course and a 1-in. wearing surface. Compacted lime rock will form the 8-in. subbase, which will be placed on 12 inches of stabilized subbase compacted to 95% of modified American Association of State Highway Officials (AASHO) specifications.

Shoulders on both sides of the roadways will be stabilized and grassed.

Trumpet-type interchanges will be utilized on the bobtail turnpike, save for the two terminals, where barrier-type stations are being erected. Interchanges will be located at: Hollywood; state route 84, south of Fort Lauderdale; McArthur, north of Fort Lauderdale; Pompano; Delray; Palm Beach; Jupiter; and Stuart. Service areas will be located at Pompano, West Palm Beach and south of Fort Pierce.

A principal service area, containing a restaurant and gasoline, oil, and diesel fuel facilities, is being erected near West Palm Beach. Minor service areas, with snack bars instead of a restaurant, will be located near Pompano Beach and northwest of Stuart. The service areas will be placed in a widened center median and will serve traffic from both directions.

Section maintenance areas will be established near Pompano Beach and Stuart. A division maintenance area will be located near West Palm Beach.

An interesting construction note on the bobtail is the manner in which the Turnpike Authority assured farmers of their water supply. Much of the bobtail route parallels a north-south canal. Col. Thomas B. Manuel, chairman of the Turnpike Authority, promised farmers that the present canal would be enlarged and that another canal would be excavated on the other side of the turnpike along with necessary laterals.

The bobtail was expected to require about 14 million yards of embankment. Between 9 and 10 million yards of this fill will come from the canals and ditches. For 36 miles, from the Hillsboro Canal to the West Palm Beach Canal, the borrow ditch becomes a part of the canal system of the Lake Worth Drainage District, which is a part of the Central and Southern Florida Flood Control District.

Material taken from the canals is stockpiled for three or four days, then is placed in the embankment with optimum or optimum-plus moisture.

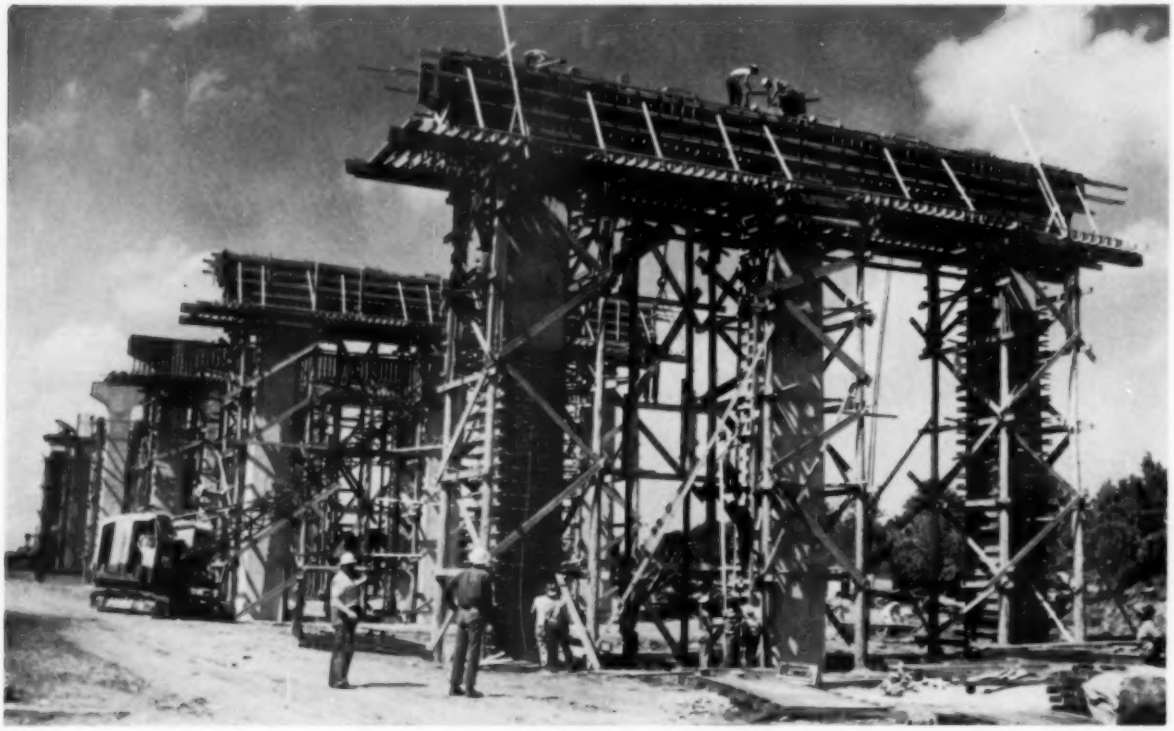
Contracts usually were awarded for the construction of three to five bridges, with a few covering six and another seven. Three contracts were awarded for construction of the St. Lucie Bridge, one each for the substructure, superstructure, and handrail and deck. The bobtail will have 86 bridges.

Roadbed and limerock base contracts covered lengths from about 10 to 14 miles. Eight surfacing contracts covered lengths ranging from 10 to 20 miles.

Paving contract specifications required that contractors have portable plants and a materials stockpile large enough to assure a supply of 100 tons per hour for laydown.

Turnbull feels that the turnpike's testing laboratory near Fort Lauderdale is probably the most complete of its type owned and operated by any turnpike agency in the country. In Florida, only the state road department has a more complete testing laboratory for all road construction materials. Jack R. Swaine is testing engineer at the turnpike laboratory.

The turnpike will have beauty, too. Interchanges will be landscaped with palms and other native Florida vegeta-



Operating 55 feet above the ground on top of columns, carpenters erect forms for caps on the bridge over the St. Lucie canal.

With an Allis-Chalmers tractor standing by to lend a pushing assist, borrow is loaded to a dump unit by a 3-yd. dragline.

tion. Lakes have been created near many bridge sites.

Excavating Engineer visited several of the jobs on the bobtail section in April, when the grading, drainage and fencing work for the entire job was about 50% complete. About 10 million yards of fill, or nearly 70% of the required total, had been placed in the embankments.

Problems on most bobtail grading contracts are similar. The bobtail's route is in the east coastal area of southern Florida, a flat marl and limestone shelf covered with sand and also some muck where the sand ridge was breached in ancient times. The underlying rock formations, composed of sand, shell and calcium carbonate cementing material, generally are soft and unconsolidated.

The bobtail is being constructed on embankment with few, if any, cut areas. Borrow, consisting mostly of white "sugar" sand and weakly cemented materials from underlying formations, is obtained from canals, side ditches and nearby areas. Muck is disposed of when encountered.

The job is largely one for scrapers, draglines and bulldozers. Compaction—95% of modified AASHO—is obtained in the normal run of the heavy equipment over the fill.

One of the largest and most difficult grading contracts is held by the Ralph E. Mills Co., Frankfort, Ky. The $747,-423.10 contract covers the 5.8-mile section 2.1 of the Parkway, from Prospect Road north to Sample Road, west of Pompano Beach.

George C. Weiss, who handles all of Mills' work in Florida, is project manager of a job that called for the placing of 1,200,000 yards of embankment. He figured that 1,750,000 yards would have to be moved to obtain the required compaction. Actual construction started last January and was scheduled to be finished in September.

One of Mills' most difficult problems was in keeping equipment rolling over

Mills' 71-B dragline, working 20 hours a day, digs canal and stockpiles the material. Mills' 5.8-mile contract includes placement of 1,200,000 yards of embankment.

(Above) A TD-24 dozer levels the material stockpiled by the 71-B. (Below) One of the tasks of this new Tournatractor is to maintain the haul roads in Mills' section.

the fine sand and muck. The jeep was a must for liaison duty. All haul roads were spread with rock. Motor patrols constantly tended them. The sand wore heavily on roller rails.

A deposit of heavy muck also was found in what will be a 300-ft. wide service area, stretching about a mile and a half between the opposing roadways.

Preserve Natural Beauty

Many snakes with dubious reputations were found when the service area was selectively cleared. Extreme care was taken to preserve the natural beauty of the area. A lake was dug.

Except in the service area, canals will border both roadways. Depth of the canals ranges from 12 to 15 feet, with a top width of 55 feet and bottom width of 15 feet.

Weiss estimated that side ditches would provide approximately 50% of the necessary fill. Other material came from five borrow areas, with hauls ranging up to 8,000 feet. The average haul was about 4,500 feet.

At the time of our visit, the Mills spread was working one 10-hour shift six days a week. Mills' Bucyrus-Erie 71-B dragline, however, was working 20 hours a day digging the canal and stockpiling. Equipped with a torque converter and swinging a 4-yd. lightweight Hendrix bucket, the 71-B was averaging

Using a 2½-yd. bucket in the borrow area, Mills' Lorain 820 loads Euclids.

about 8,000 yards of excavation in 20 hours.

Two draglines—a Northwest 80-D with a 3-yd. bucket and a 2½-yd. Lorain 820—were working in a borrow area 300 feet off the right-of-way on the south end of the job. A 2-yd. Bucyrus-Erie 38-B dragline was digging canal. Protective berms where the turnpike crosses the Pompano Canal were being built by a 2-yd. Model 6 Northwest dragline.

Three other rigs were active. A ¼-yd. Model 41 Northwest dragline was mucking out material on the extreme north end of the project. A Lima truck crane was hauling culvert pipe. The concrete crew had a Bucyrus-Erie 22-B crane for pouring.

Also working in the fill area were

Concrete pipe on the Mills job is handled by this truck crane. The Kentucky contractor was to place 24,000 lineal feet of concrete pipe, 24-72 inches in diameter.

three Cat DW21 scrapers and two Euclid S18 scrapers, all of 18 yards capacity, and 10 Euclid 13-yd. bottom dumps. They were placing the material on the fill for the bridge across state Route 7 (Prospect Road).

Ten Dozers Active

Ten bulldozers—Cat D8's, International TD-24's and Allis-Chalmers HD-20's—were active, as was a Model C LeTourneau-Westinghouse rubber-tired Tournatractor, which Weiss said was working successfully in the sand on pushing, dressing and haul road assignments. Two Caterpillar No. 12 Motor Patrols worked on haul roads. A Euclid water wagon also was used.

Minor equipment repairs were handled in the field. Greasing was done at night through use of a portable greasing outfit mounted on a GMC short-coupled truck.

Mills' contract included the construction of eight culverts varying in size from 7 x 7 to 12 x 12. The Kentucky firm also was to place 24,000 lineal feet of concrete pipe ranging from 24 to 72 inches in diameter.

Mills also built a wooden construction bridge on steel piers across the Pompano canal. The bridge, capable of handling 80 tons, was to be torn down at the completion of the project.

Fencing work was subcontracted to Ammon McClellan, Okeechobee.

The Mills Co., which has been in the contracting business for more than 30 years, employed about 150 men at the peak of its activity on the Florida Turnpike. It channeled equipment to the job from Salem, Va., and from the home office at Frankfort.

Mills had two contracts on the West Virginia Turnpike. The longest one was valued at $8 million and involved the moving of nearly 4 million yards, mostly sand rock, from steep side slopes. The company does much rock crushing for dam projects. It was one of the Atlas contractors group in Africa.

Velmar (Rocky) Bottom is Weiss' grading superintendent on the Florida Turnpike. Gus McMullen is concrete superintendent; Albert Stewart, master mechanic; and Jim Gunby, office manager.

Five Caterpillar DW21 scraper units from Troup's fleet of 11 take stockpiled sand which they will place in the embankment. Hauls on Troup's job averaged two miles.

Another bobtail contract scheduled to be nearing completion is the grading and drainage job Troup Bros., Inc., Miami, has on the 3.8-mile section 1.1 extending from Hollywood Boulevard north to the south fork of the New River. This section of the Parkway cuts through the Seminole Indian Reservation.

The job, which was awarded last fall on a bid of $406,652.50, involved the placing of 770,000 yards of embankment. Of this total, 250,000 yards came from side ditches; the remainder came from a borrow pit.

At the time of our visit, Project Manager Donald Grubbs was obtaining

Clean-looking and busy equipment characterized the 4.78-mile contract of the Hooper Construction Co. Here, a Bucyrus-Erie 38-B and a Lima 750 team up to dig a canal.

borrow from the canal and one pit. In both cases, a Bucyrus-Erie 54-B swinging a 3-yd. dragline bucket did the excavating. In the early stages of the project, Grubbs also used a Bucyrus-Erie 38-B on the canal excavation and a 22-B on dressing.

Working two 10-hour shifts, the 54-B in the borrow pit stockpiled the sugar sand. Later, Caterpillar DW21 scrapers from a fleet of 11—five of 25 yards capacity and six of 18 yards—took the stockpiled sand and placed it in the embankment. Hauls during the course of the job ranged from scratch to three miles. They averaged two miles.

D9's Push Scrapers

Grubbs estimated that scrapers in a 10-hour day were placing between 4,500 and 5,000 yards in the embankment in 8-in. lifts. Two Caterpillar D9 tractors provided pushing assists for the scrapers in the borrow area; two D8's pushed them on the spreading end.

Keeping haul roads open for the rapidly-paced movement of the scrapers was accomplished by a Cat No. 12 grader.

Bottom width of the canal which the other 54-B was digging ranged from 6 to 40 feet. Its depth was about 10 feet. The 54-B cast the material directly to the roadway, where a D8 spread it. The 54-B averaged about 1,600 yards of excavation per 10-hour shift.

Minor structures on the Troup job include one box culvert and about a dozen drainage culverts, for which about 1,000 yards of concrete were required.

Digging a side ditch, a Cat scraper unit gets a push from an Allis-Chalmers HD-21 tractor. Canals provide much fill.

A 1201 with 4-yd. bucket deepens canal where a bridge later will be constructed.

Servicing was handled in the field from a tracked Athey greasing wagon.

Contact with the home office, located about 30 miles from the project, was maintained by a two-way Motorola radio system. Eight trucks were on the hook-up.

Troup went to work on section 1.1 early this year. At the peak, it employed about 40 men.

In addition to Grubbs, other Troup officials on the job include E. T. Brisson, grading foreman; R. H. Thurston, field engineer; and H. L. Sellers, mechanic.

"This is strictly a scraper job," Grubbs said. "The fine sugar sand makes it difficult placing embankment—it's hard to get traction—but the biggest problem we had to lick was obtaining the right of way. After we did obtain it, we had to move about 12 houses."

Troup also held another contract on the bobtail, for 10.8 miles of roadbed and base in section 5.3 for $713,790.

Clean-looking and busy equipment characterized the 4.78-mile grading and drainage contract the Hooper Construction Co. of Miami held on section 1.3 of the bobtail. Many of Hooper's rigs smacked of fresh paint. Even as one of the excavators steadily stockpiled sand, *Excavating Engineer* saw the oiler sweeping dirt off the rig.

Rapid-Fire Operation

Working a single 10-hour shift six and seven days a week, Superintendent John Stanton directed a rapid-fire operation that was placing an average of between 16,000 and 17,000 yards in embankment daily. Hooper began work on the contract in mid-January and was scheduled to be finished in late summer.

Totals included 950,000 yards of embankment and 25,000 yards of subsoil excavation. Approximately half of the fill came from side canals; the other half was provided by borrow areas. One of the hauls from borrow area to embankment was 8,000 feet; another was 3,000 feet.

Four draglines were active the day of our visit. A 4-yd. Lima 1201 was deepening C-13 canal, where a bridge to be built under another contract will cross. A Bucyrus-Erie 38-B and a Lima 750, both with 2¼-yd. dragline buckets, teamed to dig the side canal. A Bucyrus-Erie 54-B with a 4-yd. bucket was loading Euclids with stockpiled borrow. All the machines had Hendrix buckets.

Colonel Thomas B. Manuel is chairman of the Florida State Turnpike Authority.

Nine 12-yd. Euclid bottom dumps worked under the 54-B.

Three Caterpillar DW21 scrapers of 21 yards' capacity dug side ditches and placed the sand on the approaches to the canal bridge. Pushing assists were provided by an Allis-Chalmers HD-20 tractor and a Cat D8. Other equipment included six bulldozers—an HD-20, two D8's, two D7's and a D6—two McCoy sheepsfoot rollers and two No. 12 Cat Motor Patrols.

Two mechanics were attached to the spread. For servicing, a 4-wheel drive greasing rig was available. It carried a Worthington 150-cfm compressor.

"Everything's going like we expected," said Stanton, a deep-tanned southern gentleman who spoke in a soft

Continued on page 48

Perched atop stockpiled borrow, a Bucyrus-Erie 54-B with a 4-yd. bucket loads the material to one of nine Euclid dumps.

A 3-yd. shovel handles intermediate stripping of waste overburden just above the uranium orebody at Anaconda's Jackpile open pit mine. Material is soft, abrasive.

Uranium: Courtesy of Anaconda

by Ray Day

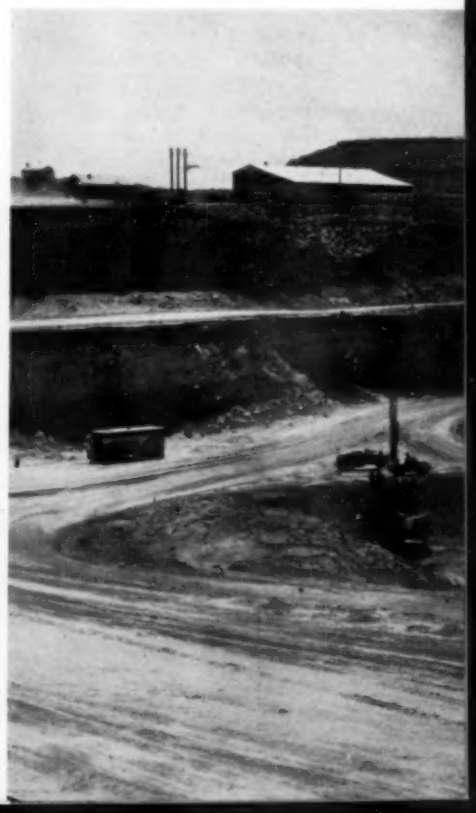
LARGE-SCALE uranium mining by the open-cut method has been introduced to south central New Mexico by The Anaconda Co. In a rapidly expanding open-pit mining operation north of Laguna, Anaconda has demonstrated some interesting differences in mining uranium from conventional minerals.

Consider, for example, this somewhat typical sight: Up on the benches where overburden is being stripped away, 5-yd. power shovels work as fast as their operators can make them swing. Almost within a stone's throw below these big, modern shovels, Indian laborers with brooms sweep the last precious granules of uranium ore from the top of a diabase dike, which runs through the pit. Tin covers protect other parts of the uranium ore distribution system from blowing winds, so none of the precious uranium dust is blown away. A 22-ton load of rock from a highway cut is worth about $14 to an average highway contractor. The same truckload of uranium ore is worth nearly 20 times that much on today's market, assuming a high grade of ore.

From an excavating man's standpoint, a number of features about the Laguna open-cut operation have unusual interest. The stripping to ore ratio is unusually high—exactly how high is classified information. There is an unusual abrasion problem because the sandy rock formation runs up to 60% silica. An all-Indian crew, with the exception of a few key supervisors, has been developed, even to equipment operators, because the site is on the Laguna Indian Reservation. Possibly the most unusual thing of all is the rapid expansion which is under way to develop the site to its ultimate.

Anaconda began the first uranium mining in the fall of 1953 with a very modest operation involving only a few tractor-mounted front-end loaders and Koehring Dumptors. By January 1, 1956, the decision had been made to open cut the hill, and excavation had advanced to the point where the company had seven 22-ton end-dump Euclids and a few shovels. In three months time that operation expanded to a fleet of 17 Euclids. A number of new shovels were added, and the amount of material handled each day climbed rapidly. Nevertheless, an orderly system of excavation and stripping has been maintained.

The first mining operations began



The Anaconda Co., a distinguished name in mining, finds interesting and unusual conditions when it decides to use open-cut methods on its biggest uranium deposit in New Mexico.

before a concentrating mill had been constructed at Bluewater, west of Grants. This concentrating plant now has been completed, so that uranium ore from six mines which Anaconda is currently operating can be concentrated into a high-grade uranium oxide for shipment. This year is the first in which mining on anything like a permanent scale has been developed.

10 Miles North of U. S. 66

The site north of Laguna is approximately ten miles north of U. S. Highway 66 in back country on the Laguna Indian Reservation. Specific descriptions of the orebody, particularly with reference to size and grade, are classed as confidential information. It can be said, however, that the orebody occurs as an undulating layer of varying thickness and at various levels. The site where uranium was found was at the edge of a high caprocked mesa. In open cutting the site it was necessary to excavate a series of sizable benches, spreading the open-cut excavation into the mountainside. Of Anaconda's six uranium mine locations in the vicinity, the Laguna operation is the only large open pit.

Anaconda's mining and stripping have followed or, in some cases, been done simultaneously with an 18 million-ton stripping contract which Isbell Construction Co. of Reno, Nev., currently is doing. This work is expected to be completed by the fall of 1956, after which time Anaconda will take all of the stripping, probably by adding a third shift for equipment already at the job. The Isbell operation is typically Isbell, in that it represents large-scale excavating in a smooth, harmonious manner. Its 18 million-ton contract will be finished in slightly less than three years' time.

An Indian geologist checks a test hole for radioactivity. Readings are used to guide excavation so that ores of varying enrichment are blended into a constant material.

Principal equipment on the Isbell stripping operation includes two Bucyrus-Erie 120-B electric shovels with 6-yd. Esco dippers, a 54-B electric machine with 2½-yd. dipper, a 54-B Bucyrus-Erie diesel with 2½-yd. dipper, 17 Euclid 22-ton end-dump trucks, three Bucyrus-Erie 29-T churn drills, a Joy heavy-duty rotary blast hole drill, and the necessary auxiliary equipment such as motor graders for haul road maintenance, water trucks for sprinkling, and a complete shop setup for equipment maintenance.

Shoot, Load Differently

The large-size dippers on the Bucyrus-Erie shovels, coupled with the desirability of moving high yardage in a hurry, has caused Isbell to drill, shoot and load somewhat differently than Anaconda's crews operate on the lower waste benches and on the mining end. Blast holes are of 8½ and 9-in. diameter, and are spaced about 22 feet apart, 18 to 20 feet back of the bank face. This is an average. Minimum and maximum spacing varies to as little as 18 feet and as high as 26 feet, depending on the nature of material to be broken. Part of the overburden is a grey, spongy sandstone which tends to absorb the force of explosives, so in this material

Here's a general view of the big open pit with two Failing rotaries in foreground.

A 5-yd. electric shovel owned by Isbell Construction Co. loads rock to double-spotted Eucs on one of the upper stripping benches.

hole centers must be closed up. In other formations, where the rock is more easily fractured, spacing can be widened. A system of bottom and deck loading of Apache bag-type explosives is being used by Isbell, because its chief purpose is simply to get the waste material down in pieces which the big shovel dippers can handle. To break waste material smaller would be to waste powder.

The material which Isbell has dug is being wasted in gulches, which were carefully core drilled before dumping to make certain that no uranium veins lay underneath. The stripping which Isbell has done has now opened the way for much more efficient mining than was possible when the operation first commenced. By using its own equipment, after Isbell's present contract has been completed, Anaconda's field officials hope to keep the stripping well ahead of the actual uranium mining.

The excavation system which Anaconda is using in mining the uranium orebody differs considerably from the big-scale stripping operation as practiced by Isbell. Anaconda has a number of factors to consider besides straight production yardage. True, it must work at good production, too, but uranium ore is so valuable that no part, especially of the high grade, can be wasted. It is much better economics to run an extra load of waste occasionally with uranium ore than it is to waste even a fragment of the precious ore. For this reason a certain small dilution of uranium ore with low-grade material or waste overburden slightly above the ore is taken as a matter of course.

Shoot, Excavate Waste

The mining excavation procedure consists of shooting and excavating a bench of intermediate waste material between the orebody and the upper waste benches which were previously established by the advance stripping operations. This intermediate material is excavated down to approximately four feet above the uranium-bearing orebody. This distance is never exact, of course, because the orebody rises and falls in its undulations so that it is practically impossible to excavate at high production with large-model excavating equipment and maintain a 4-ft. constant cover over the orebody. Sometimes this excavation

An all-Indian crew loads Apache bag powder into blast holes drilled on shelf.

will reach down to a point about two feet above the orebody, and sometimes there will be up to eight feet of rock cover over the ore vein when the power shovels stop. Anaconda's management, of course, keeps a careful check on this operation at all times so that the proper balance is preserved. The idea is never to waste uranium ore, and at the same time not to permit too much rock to be mined with the ore so that it results in excessive dilution.

Under the present mining setup it is also necessary to blend uranium ores from various parts of the pit because of the varying degrees of enrichment the orebody contains, as well as variations in metallurgical characteristics. Wholesale loading of the highest grade ore, for example, on any one day would tend to disturb the metallurgical processes in the beneficiation plant, whose functions are set up for an average grade of raw materials. For this reason a loading sheet is made out each morning and given to the truck spotter where the material is dumped from power shovels. The Euclids are numbered according to various parts of the pits in which they work, and the spotter's job is to see that the trucks are dumped in the order listed on the sheet. This maintains the proper balance between high and low grade uranium ores entering the system, so that an average product can be delivered to the Bluewater plant.

A 29-T churn drill moves into position at the edge of a bank. Powder holes of 8½ and 9-in. diameter spced 22 feet apart break the rock sufficiently for the large shovels.

Still another general consideration in Anaconda's mining is the presence of a diabase sill or dike which runs through the entire area, and in some cases separates the uranium orebody. The material in this 6-ft. dike is hard, dense, brittle rock whose introduction into the beneficiation plant would unnecessarily increase grinding costs and reduce the tonnage of pay ore treated, as well as increase the acid consumption on the leaching side of the process. Diabase contains considerable calcite. Because of this undesirability, Anaconda is forced to mine the orebody down to the diabase dike, frequently sweeping up the last particles of uranium ore before drilling and shooting the dike itself. After breaking up and removing the rock dike, mining then is resumed on the uranium orebody. It is almost as ticklish an operation as if the uranium were gold. Actually the uranium might be even more valuable. At current rates for high-quality ore as quoted in present day Atomic Energy Commission literature, a 22-ton Euclid load of material is worth something like 26.

Smaller Hole Diameters

In an effort to get better fragmentation for better and easier loading, Anaconda is using a somewhat smaller system of hole diameters spaced closer together with a barrel or column-type method of loading high explosives. The main drilling rigs consist of three Failing Holemasters and two Winter-Weiss Portadrills. These machines are being used with 4¼ and 4¾-in. dian eter bits

Continued on page 36

"Years of lowest downtime"

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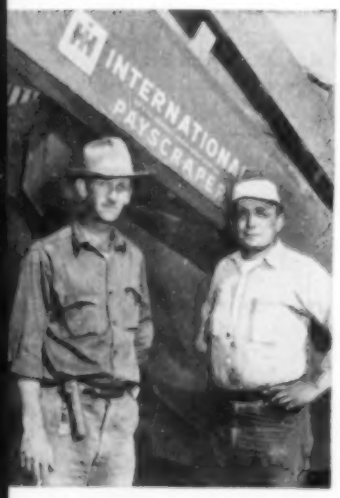

Foreman Milton D. Peterson and Supt. H. L. Radandt beside one of Radandt's new Payscrapers.

It's a $394,000 relocation and regrading job of Wisconsin 27, between Ojibwa and Ladysmith—involving clearing, grading, culverts, and sand gravel fill up to base course. Approximately ½ million cu. yds. of excavation and borrow to do.

Cuts as deep as 21 feet are required—and one 32-foot fill is necessary, because of a 22-foot deep marsh excavation, to base new road on firm footing.

A 12-unit International prime mover fleet—pushers, dozers, rubber-tired Payscrapers®, and crawler-scraper team—is what Contractor H. F. Radandt, Inc., banks on to "wind 'er up," ahead of the Wisconsin winter, with a profit!

"Have been using International crawlers since 1946," states Supt. H. L. Radandt, for the contracting firm. "Presently we have nine International crawlers and three Payscrapers in the fleet. Years of actual operation have proven International equipment had given us good service with lowest downtime. We do all our own repair work, and International design is simple to work on."

Prove how exclusive Planet Power steering with full-time live power on both tracks, plus finger-tip operating ease, give the International TD-24 exclusive production-boosting advantages! Compare capacity of new bonus-powered International equipment to anything else on tracks or wheels. Find out what International unit assembly construction means for overhaul speed and simplicity—for reduced downtime—for new upkeep economy. See your nearby International Construction Equipment Distributor for a demonstration!

"The new design 75 Payscraper bowl loads and unloads, fast and easy," declares Supt. Radandt. "Estimated average load: 18 pay yards." Here, loading time with TD-24 as pusher, the 75 heap-loads in 45-60 seconds, in silt-sand-gravel mixture!

Dumping of the new 75 Payscraper takes only 10 seconds. Higher apron lift, and bigger apron opening assure new dumping speed and positive clean-out ability. The new Payscraper's high horsepower - to - capacity ratio permits rapid acceleration to 24 mph top speed — a big yardage-booster!

The three Payscrapers in the Radandt fleet average 2200 cu. yds. per 10 hours—on a 6300 lineal-foot round trip. "The new '75' has matched engine power to deliver the payload fast, and flotation to take roughest pit or haul-road conditions," adds Mr. Radandt.

This torque-converter TD-24 is one of three International crawlers towing scrapers on the job—hauling up to 1000 lineal feet one way. With 200 net engine hp and full-time traction power on both tracks with Planet Power steering, this outfit hauls fill dirt into one of the 22-ft. deep cuts.

Another TD-24—a veteran in the Radandt fleet—spreads and compacts fill dirt on one of the marsh-excavated spots. TD-24 Planet Power steering is particularly productive on all blade work. Full-time live power on both tracks results in faster cycles, bigger loads.

—by H. F. Radandt, Inc.,

Eau Claire, Wisconsin

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A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

Uranium . . .

Continued from page 33

on a system of hole spacing which averages 16 feet between holes and 14 feet back from the face. This average centering actually varies between 12 and 20 feet in extreme ranges of material. Drill bits consist of Mills Sy-Ex finger-type bits which are used principally in the sandstone overburden being stripped above the uranium ore. Bill White jet-type finger bits also are being used for drilling in the orebody, and Williams K-2 rock bits are seeing considerable service, particularly in the drilling of the diabase dike.

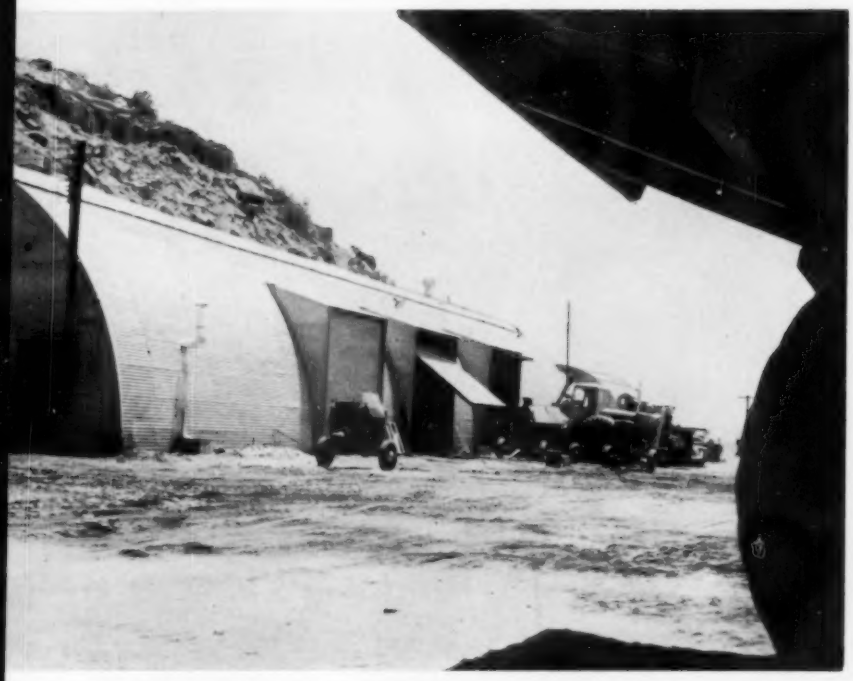
One of the principal drilling characteristics of overburden and ore alike is its abrasiveness. Other than that, the material is fairly soft and easy to drill. As a matter of fact, the rotaries frequently turn in as high as 100 feet of hole per hour.

The drill holes are being put down to an average depth of 45 feet which carries them five feet below the average 40-ft. waste bench. Ore benches vary considerably in height. Two types of powder are being used for the column loading process consisting of Apache's Quarry Bag powder No. 3, a granular free-flowing explosive which is particularly good over most of the quarry. Apache's Amogel 40% gelatin also is being used, particularly in wet spots. The powder is being column loaded to a point about 12 to 15 feet below the top of each hole, and shots are fired with Primacord detonating fuse. While the explosive ratio is fairly high, the extra fraction of a pound per cubic yard is giving excellent fragmentation, and as such is a wise investment. Finer fragmentation increases production for all the loading shovels, reduces work on the primary crusher, and even eases wear and tear on hauling units which Anaconda is using.

In addition to the drilling and shooting done by this equipment, there is also a considerable amount of work which is being done with jackhammers and wagon drills. The general slope of the open pit had been set at 1 to 1 originally, and this has since been increased to 1½ to 1 to give some latitude in the case of fingers or pockets of uranium ore which take off frequently from the main orebody. It is in such locations as this that jackhammer or wagon drill drilling has had to be practiced. There have also been numerous occasions when portions of the diabase dike had to be drilled with jackhammers, shot, and the material removed by a selective loading process. Drilling, like the entire remaining part of the operation, is a highly selective business in which special attention is given to the location of the orebody so that none of the precious material is wasted.

The power shovel fleet which Anaconda is using in its mining operation was especially selected with a view toward doing the peculiar job to the best advantage. Since loading in the orebody is such an important selective operation,

A 5-yd. electric shovel, the largest in the pit, works above the uranium orebody loading blasted sandstone from a 40-ft. bank.



This Quonset shed, framed by the rear end of a big Euclid, is headquarters for servicing a fleet of 17 Euclids. Abrasive rock, blowing dust create maintenance problems.

it was almost necessary to pick power shovels whose dipper capacity was not greater than 1½ cubic yards. For this reason a Bucyrus-Erie 38-B and a Koehring 605, both with 1½-yd. Esco dippers, were selected for the "pay" operation. A Koehring 1005 machine with a 2½-yd. dipper was selected for intermediate excavation, covering both waste stripping and some ore loading.

3 and 5-yd. Shovels

The biggest power shovels which Anaconda is using are a Bucyrus-Erie 71-B diesel with 3-yd. Esco dipper, and a P&H Model 1500 electric which carries a 5-yd. dipper. Both of these machines are being worked exclusively in waste excavation where yardage is big and production can be expected to be great and steady. Anaconda is using a General Motors 625-KVA Electro Motive trailer-mounted generating set which delivers power to the P&H shovel at 2,400 volts. This generating set is entirely self-contained within a dust-tight trailer which houses the General Motors diesel engine, the generator and switchboard apparatus. All air going into the machines must enter the trailer through filters which remove the dust. Since the trailer is highly mobile, only 1,000 feet of power cable is being used between the Electro Motive set and the P&H shovel. It is believed that a transformer conversion may soon be put in which will send power to the shovel at 4,160 volts instead of 2,400.

Hauling units under the shovels currently includes 17 end-dump Euclids of 22-ton capacity—including Models 36-TD and 63-TD. Five more of these trucks are on order. These big trucks are equipped with torque converter drives which take a great deal of the hauling shocks off their transmissions. To make their job still more efficient, an Adams motor grader works constantly polishing haul roads on the 40-ft. berms, and there is also a great deal of water truck equipment to keep the dust sprinkled down. The sprinkling operation is important because silica dust is present everywhere.

Euclids from the Bucyrus-Erie 71-B and the 5-yd. P&H machine are dumping their waste material into nearby waste areas to get that material out of the way. The uranium ore, which is being loaded at several places in the pit, is being blended, as has previously been stated, by setting up a definite loading and dumping order from each pit location depending on the degree of uranium enrichment in the ore.

Interesting Ore Disposal

Disposal of the ore, of course, is one of the most interesting parts of the operation. The big Euclids back into a feeder hopper which holds approximately 80 tons of material when it is completely filled. Underneath this feeder hopper is a Pioneer Oro plate feeder, electrically powered, which feeds the uranium ore into the system as needed. The plates of

A 1½-yd. shovel digs 'pay dirt' on the pit floor. Small amounts of low-grade material above the uranium orebody are mined along with higher grade ore to avoid waste.

Euclids await their turn at the receiving hopper to unload. Dump man has authority to hold any load to keep material uniform.

this feeder are kept covered with ore at all times so that when heavy truckloads of material dump in they dump on ore rather than directly on the feeder plates. The sides of the hopper slope up from the plate feeder, so that the hopper cleans itself continuously.

Since all hauling of uranium ore is being done in bottom-dump railroad cars furnished by the Santa Fe, it is necessary to reduce the ore at least to minus 12 inches so the cars can dump freely at the Bluewater concentrating plant. To get this result, Anaconda drops the ore off the end of the Pioneer plate feeder over a sloping set of grizzly bars set at 10-in. clearance. Material already meeting size requirements drops through the grizzly bars and passes on down to 425 feet of 48-in. conveyor belt which leads out to the railroad loading point on almost a level grade. Oversize chunks retained on the grizzly bars drop down through the jaws of one of the biggest overhead eccentric jaw crushers made in the United States today —a Pioneer 42 x 48 unit powered by a 200-hp Murphy diesel. Uranium ore is not difficult to crush, and this big machine has no difficulty whatever taking care of its assignment. Throughs from the jaw crusher plates join the finer material on the delivery conveyor which leads out to the railroad loading point. A system of red and green signal lights between the crusher control house and the railroad loading point permits the operator and the railroad crew to coordinate their efforts so that three equally-sized piles are placed in an average 80-ton car.

By the time this article appears in print, the entire crusher area as well as the 48-in. delivery conveyor line will be completely housed in a windproof corrugated iron protective shelter. The loss of uranium dust from prevailing winds is such an important factor that these preventive measures had to be

J. B. Knaebel (right), manager of New Mexico operations, discusses the open pit project with his assistant, Albert T. Fitch. Underground mining also is in progress.

taken. This, too, gives some idea of the value of this material as crews and equipment work to extract it from the earth's surface.

Not too much information is publishable on the final processes which take such an orebody as this and reduce it eventually to the finished materials from which atomic piles and weapons and nuclear fuels for peacetime use are manufactured. Anaconda's concentrating process is a fairly conventional operation. The carloads of uranium ore are dumped from railroad cars into a crushing and screening system where the material is finely pulverized. Acid and alkaline leaching processes then precipitate the uranium so that the final product shipped from Bluewater is a high-grade uranium oxide. There is still much purification work to be done on the material, of course, before it can be used in bombs or power plants.

Two Other Factors

There are two other factors in evidence at the Laguna mining operation which show a long-range awareness on Anaconda's part of the over-all importance of uranium in future geological and mining knowledge. The first example is in connection with low-grade uranium ore deposits which are unprofitable to mine in 1956 on the basis of present precipitating processes. Anyone who believes that America will traditionally waste all its resources should see what is being done with this low-grade material. It is not being hauled to dumps with stripped waste. Rather, Anaconda is going to a bit of extra trouble and expense here to separate this low-grade material and to store it in well-defined stockpiles. There may come a day when better leaching processes will be developed so that it will become economically sound to handle such low-grade material. That happened in the copper industry and it may very well happen in the uranium industry.

Anaconda also has under way several small open pit and underground mining activities. One of the latter, named "Woodrow Mine," contains a uranium orebody which occurs here in a breccia-like formation. The formation extends from an outcrop at the surface of the ground to a point beneath the earth where underground mining is done. While the uranium ore here is definitely of value, the underground work also is being done with a view toward enlarging the general geological knowledge of uranium and its occurrences. With the help of a small steel headframe, a 75-hp mining hoist, a Caterpillar 100-KW generating set, a Chicago 600-cfm air compressor, a blower system, and underground mining drills, the orebody is being mined and carefully measured and plotted. Perhaps in this mining operation some additional knowledge may come to light which may make it easier in the future to predict where uranium will occur. This work, therefore, is more than excavation; it is the advancement of professional knowledge of mining.

Here is a closeup of the crusher. It is necessary to reduce the ore to at least minus 12 inches so that the bottom-dump railroad cars can dump freely at Bluewater.

There are two problems at this location which make equipment upkeep specialized and interesting: (1) the problem of abrasion, and (2) the problem of blowing dust created by prevalent strong winds.

A good example of the abrasion problem is a preventive maintenance which is being used on dippers and teeth. Esco rock points are being used on the dipper teeth, but even before these special rock points are put on they are protected by wedge points, and the entire rock point is further protected with Ranite C hardfacing rod. Dipper teeth are then watched very carefully until the wedge point wears down almost all the way, after which another wedge point is put on the Esco rock points. By using such preventive measures, Anaconda is getting up to eight uses from a rock point, where otherwise the heavy sand abrasion would cut the number of uses down to two. Dippers also are constantly being hardfaced, and there is scarcely anything on the project which rubs against ore or waste material which is not protected by hardfacing,

Continued on page 48

Ditch Fill Compacted by 'Jetting'

EDWARD KEEBLE, contractor of San Jose, Calif., for years has been using 1-in. streams of water under pressure to compact his ditches after they are filled. He calls the process "jetting."

Two workmen can compact about 500 feet of ditch, running as deep as 16 feet, per day. Each man handles a length of 1-in. pipe about 12 feet long which is connected by a 1-in. hose to faucets on a portable aluminum 4-in. pipeline.

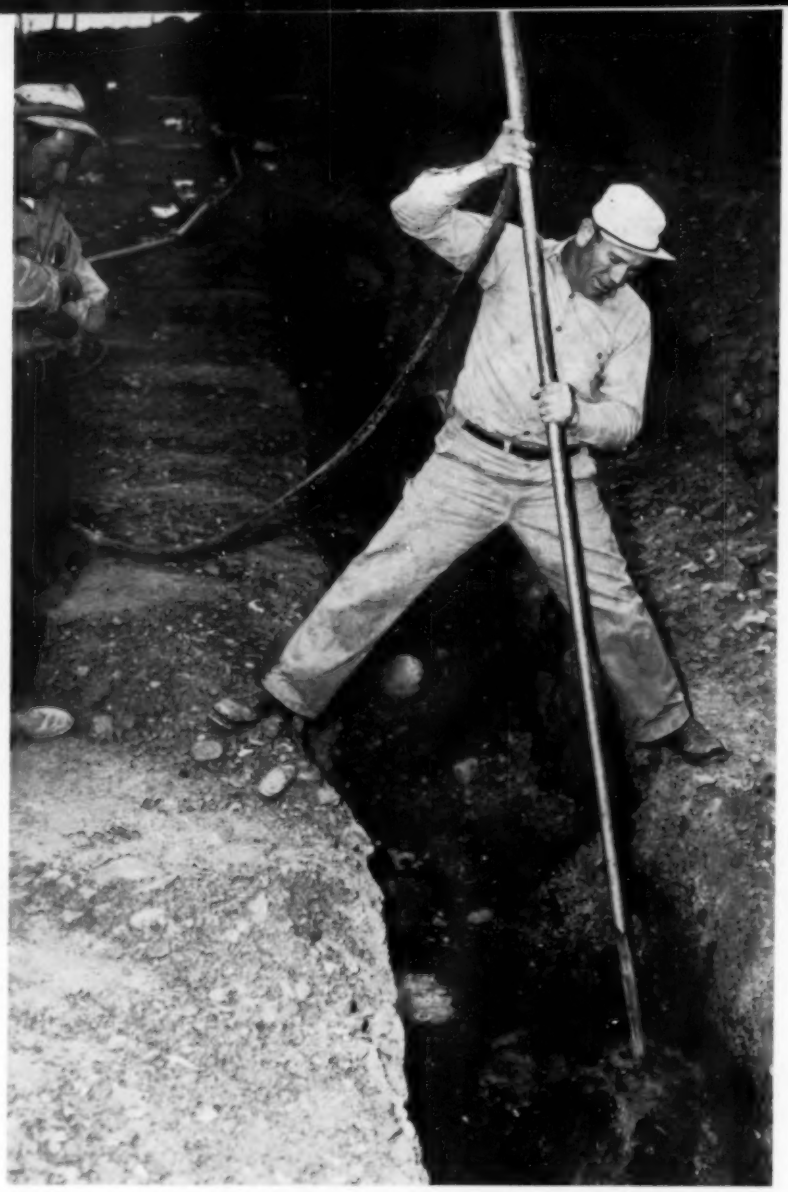
The 1-in. pipe is thrust straight down a few inches into the soft dirt filling the ditch. The pressure of about 80 psi then keeps working or "pulling" the pipe deeper until the lower end of the small pipe has penetrated to the bottom of the ditch. As it lowers itself into the ground, the jetting softens and compacts the soil. The picture (right) shows how the soft dirt has sunk from ground level in the process.

20-ft. Long Pipes

By employing 1,000 feet of the 4-in. portable aluminum pipe, Keeble finds it possible to use the line continuously without having to stop when moving to another location. The 20-ft. long pipes in the pipeline are quickly connected and disconnected from the central carrying point of the pipe. One man carries two or three lengths of the lightweight pipe. Sometimes 30-ft. and 40-ft. lengths are used.

When Keeble first bought a portable aluminum pipeline, he got one with a coupler that was actuated by a spring. Sand and dirt got into the spring with the result that latching was not complete and when the water was turned on, the pipeline flew apart under the surge of hundreds of gallons of water at 80 psi. By looking around, he found a type of coupler in which the latch is positively forced closed by the force of inserting the pipe. Since then, he has had no trouble.

Two men process 400 to 500 feet of trench per day using water under high pressure.

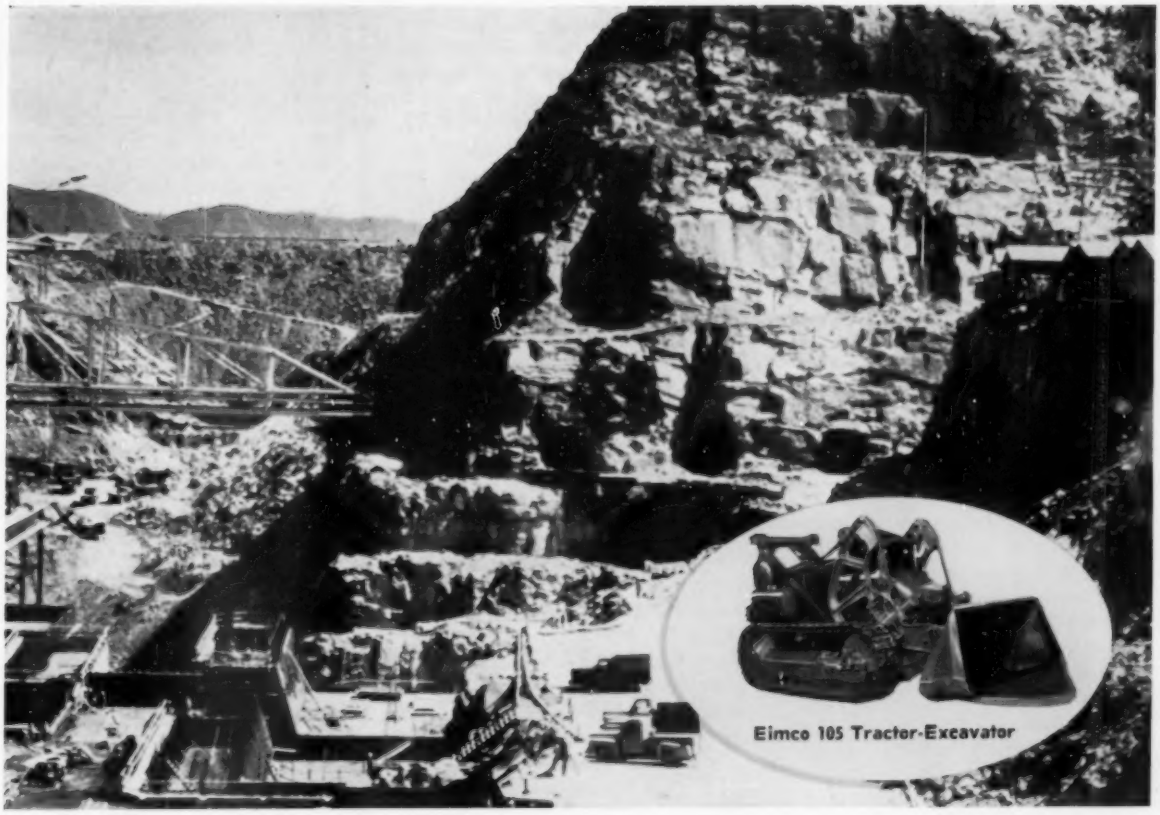


A workman for Edward Keeble, San Jose, Calif., compacts ditch fill using 1-in. streams of water under pressure. Two workmen can jet up to 500 feet of trench per day.

Keeble uses the pipeline on all ditch and compacting jobs, either jetting or, by adding risers and sprinkler heads every 20 to 40 feet, as a sprinkler system to soak down the ground. He is planning now to use the line to pump water from a subway excavation job. He has tried the line to carry compressed air with varying but generally unsatisfactory results.

The pipeline is used eight hours a day, five days a week for stretches of several weeks at a time. Originally it was bought to compact sand during construction work at Fort Ord, Calif. Since then the pipeline has been used in various parts of the state. Flexibility of the pipe at the couplers permits a bend of about 17° each coupler, thus allowing the laying of the pipe over uneven or hilly terrain.

Roy Harris, superintending the ditching job pictured here in Los Gatos, Calif., says: "The beauty of it is this 4-in. pipeline carries enough water for six 1-in. jetting lines. We use 1-in. outlets to retain pressure. It's the pressure coming from the jet pipes that digs into and softens the soil so it will compact. The jet pipe works its way down into the soil by water pressure so that if it were allowed to do so, it would bury itself within a few minutes."



INDIA – EIMCO 105's KEEP GRUELLING SCHEDULE

Two Eimco 105 Tractor-Excavators have each worked 8,000 hours in 12 months to keep progress on schedule at a huge dam project in India.

The machines have received intelligent maintenance and repairs have been small.

Eimco 105 Tractor-Dozer

At work on diversion, penstock and highway tunnels, trained Indian crews operating the 105's are doing an excellent job of tunnel driving. In some instances, advance for the size of tunnel being excavated may establish new world records.

"Eimco 105's are preferred equipment to use for tunnels of this type," says one official of a contracting firm. "The transmission, clutches and drive on both machines have not been touched in 8,000 hours of operation. They are in good condition and we expect them to last many more years."

Have you considered why the Eimco 105 is "preferred equipment" to contractors of huge dam, tunnel and road projects in the export market?

It's becauuse their dependability is reflected through their engineered strength to stay on the job around the clock – day in and day out.

The Eimco 105's dependability eliminates the necessity of a sizeable parts depot. Eimco's are built to 100,000 hour standards for service in remote areas. Time saved by Eimco's working continuously with no down time for repairs is a big factor in selecting equipment.

Conditions being equal, Eimco 105's will produce more at less cost and in less time than comparative equipment. Let Eimco show you how this versatile unit can outperform and out-work heavier, more expensive units.

See the Eimco 105 before you buy any crawler tractor equipment.

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Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

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B-214

News from the Field

Develop Peru Copper

Development of extensive copper deposits in the Toquepala district near Ilo, Peru, has begun. Open pit mining will be operated by Southern Peru Copper Corp., which is formed by American Smelting and Refining Co., Cerro de Pasco Corp., Newmont Mining Corp. and Phelps Dodge Corp.

An expenditure of $200 million will bring the Toquepala project into production. This represents $100 million which the participating companies have set aside and a $100 million loan approved in 1954 by the Export-Import Bank.

One of the world's largest known copper deposits is represented in the Toquepala mine and in its two sister mines, the Quellaveco and the Cuajone. Additional expenditures will be required to bring the Quellaveco and Cuajone mines into production.

The Toquepala mine, which lies 56 miles inland from Ilo, contains an estimated 400 million tons of low grade ore, which will produce an estimated 140,000 tons of blister copper annually for 10 years.

The Cuajone mine contains an estimated 500 million tons of ore; another 200 million tons are in the Quellaveco mine. Overall, the three mine contain more than 1 billion tons of ore running approximately 1% copper.

Actual copper production at Toquepala mine probably will not be realized for about 4½ years, until 126 million tons of overburden are removed by electric power shovels. Off-the-road hauling units will take the overburden to disposal areas ranging from 5,000 to 8,000 feet away from the digging area.

Preliminary phases in the development of the deposits include the construction of a port at Ilo to handle ore shipments. Equipment needed for construction of the port was landed by amphibious methods. Equipment included five Caterpillar DW21 and Athey PR21 wagons, a D9 tractor, two D8's, No. 12 and No. 112 motor graders, two Cat Diesel D318 electric sets and a No. 955 Traxcavator.

Foley Hermanos, Ltda., a subsidiary of Foley Bros., Pleasantville, N. Y., is constructing the port facilities. Primarily, the job consists of a 900-ft. rock approach ending in a 600-ft. concrete pier. About 500,000 tons of granetoid rock were hauled more than half a mile from a quarry. Foley Hermanos also is preparing a storage area for Southern Peru Copper Corporation's warehouses and equipment storage.

With the exception of the port construction and the mine preparation work to be performed by Southern Peru Copper, the balance of the construction has been awarded to a joint venture formed by Utah Construction and Morrison-Knudsen.

Other construction details include the completion of a smelter, steam power plant, concentrator, roads, railroads, homes and other facilities. A temporary diesel power plant of 6,475 KW to supply initial power for shovels must be provided.

Plans have been developed to build a standard gauge railroad approximately 130 miles long through extremely rugged country to connect the concentrator

Continued on page 47

Correction

The firms of J. C. O'Connor & Sons, Inc., Fort Wayne, Ind., and Taylor Wheless & Co., Jackson, Miss., were omitted from a listing of prime contractors engaged in construction of the Indiana toll road. (See *Excavating Engineer*, July, 1956, page 63.)

Work on contract 10/10A is being executed by Bates & Rogers Construction Corp., Chicago, Ill., and J. C. O'Connor & Sons, Inc., as a joint venture under which Bates & Rogers is performing structural work and the O'Connor firm is handling grading, muck removal, drainage, paving and shoulders. The $6,086,571 contract, located in Lake County, is 2.5 miles long.

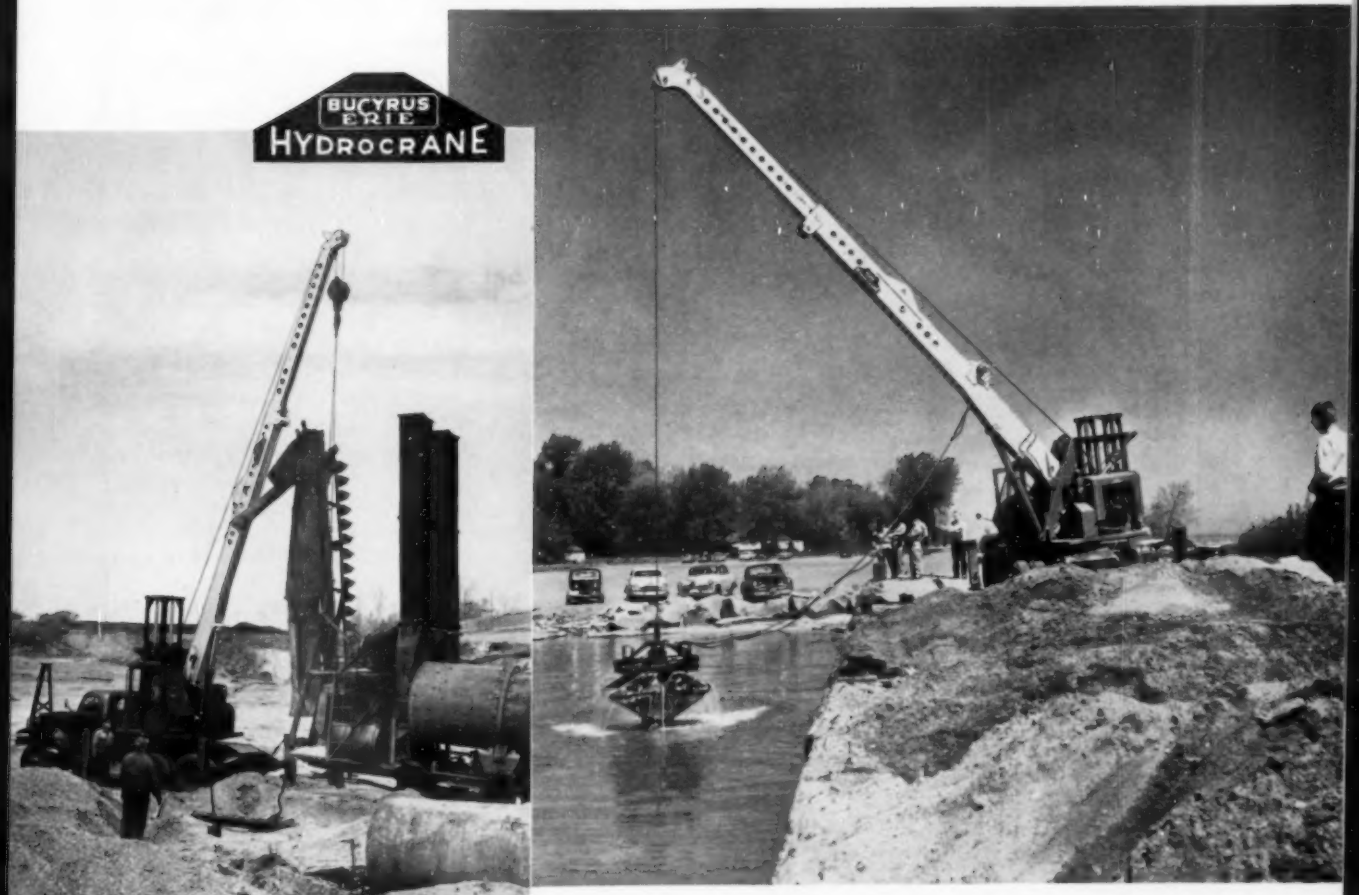
The O'Connor firm is a subcontractor on contract 9, handling paving, shoulders, curbs, concrete base and other items. Bates & Rogers Construction Corp. is the prime contractor. The section covered under contract 9 is 2.5 miles long and is also located in Lake County. Amount of the prime contract is $8,222,017.

Taylor Wheless & Co. has performed work on contract 17, 18 and 19 in joint venture with Winston Brothers Co., Minneapolis, Minn. The $7,577,792 contract, located in Porter and LaPorte counties, is 13.4 miles long.

A Caterpillar D8 tractor constructs a jetty which will be used for amphibious landing of construction equipment at Ilo, Peru.

BIG PRODUCER IN SAND AND GRAVEL

Hydrocrane Handles Many Jobs Profitably



A ½-yd. H-5 Hydrocrane excavates gravel from a slip and stockpiles it for later loading.

A 10-ton H-5 Hydrocrane erects a hot mix plant in a gravel pit. Equipped with hydraulic clamshell, it's an excellent digging, loading or unloading tool.

Loading from bank or stockpile . . . unloading cars . . . filling bins . . . or charging hoppers . . . the H-5 Hydrocrane does them all with hydraulic speed and precision. That's why it's the ideal crane for sand, gravel or cement plant work . . . why it keeps busy, productive, profitable.

With this 10-ton capacity telescoping boom crane, you can switch from crane hook to ½-yd. or ¾-yd. clamshell bucket in a matter of minutes. It moves at speeds up to 50 mph from plant to job sites, from pit to plant, from bin or hopper to stockpiles with conventional truck agility. Two-piece boom telescopes from 24 to 36 feet, three-piece from 38 to 50 feet. Both retract to 25 feet for travel.

But the Hydrocrane gives you a lot more. Even your unskilled help can handle it well, after only a few hours of instruction. Sturdy outriggers set or retract at the touch of a lever . . . let you set up or get away fast.

See a Hydrocrane in action on your job. Your nearby Bucyrus-Erie Hydrocrane distributor will be happy to demonstrate either of the two models—10-ton H-5 or 5-ton H-3.

127H56C

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

NOT in the Contract

"Now, Eliza, as I understand this case you and Rastus had a drunken altercation and you were kicked in the ensuing rumpus?"

"No, sah, Mister Jedge! Ah was kicked in de stummick!"

An old lady kept a parrot which was always swearing. She put up with this, but on Sunday she kept a cover over the cage—removing it on Monday morning. One Monday afternoon she saw her minister coming toward the house, so she again placed the cover over the cage. As the reverend gentleman was about to step into the parlor, the parrot remarked: "This has been a damn short week!"

The day was rainy and the cellar leaked. Bertram, 5, was having a wonderful time sloshing around in the water when his mother caught him, soaked to the skin. As punishment he was ordered to stay in his room until his pants were dry.

A short time later his mother heard a commotion in the basement. "Are you down there wetting your pants again?" she bellowed.

There was a long pause and then a deep masculine voice replied: "No, Ma'am, I'm just reading the meter."

A fire enveloped a rooming house, trapping a Nebraskan, an Ohioan and a Texan.

Some 15 hours later, the ashes of the Ohioan and Nebraskan were found by firemen, who next went to the Texan's room.

Suddenly, the door opened. Out walked the Texan mopping his face with a handerchief.

"Boy," he said, "if we get two more days of this hot weather, it'll ruin the cotton for sure!"

Even the morticians are in the credit business: "Use our lay-away plan. Pay now. Go later."

"I'm leaving you Herman. I'm tired of getting pushed around."

The family had overslept, and Mrs. Smith woke with a start to the clanking of cans in the street. She remembered that the garbage had not been put out and raced down to the front door, struggling into a robe, with her hair in curlers, and looking rather sleepy-eyed.

"Yoo hoo," she called, "Am I too late for the garbage?"

"No," shouted the collector, "Jump right in."

A young girl got a job running a department store elevator. The first morning she ran it, she went up all right, but when she came down she stopped very suddenly.

"Oh, my," she exclaimed, turning around to the passengers, "did I stop too quickly?"

"Oh, no," said a bewildered woman, "you didn't stop too quickly, I always wear my girdle around my ankles."

The old Southern colonel came down to breakfast wobbly and considerably bleary-eyed, but stiffly erect in a show of dignity.

As he sugared his coffee, his wife noticed that one of his hands was bandaged. She asked an explanation.

"It was a matter of small consequence at our lodge banquet last evening, Magnolia," he told her. "Some of our younger brothers who can't handle their likker got a little under the weather. One of them stepped on my hand."

The baby sardine saw its first submarine and went swimming in terror to its mother.

"Don't be frightened, darling," she reassured him, "it's only a can of people."

Mrs. McTavish looked out the window as the family was going in to dinner and wailed, "Och, Jon, here comes company, and I bet they haven't eaten yet."

"Quick!" ordered the Scotsman. "Everybody out on the porch with toothpicks."

Title for a song: "She Was Only a Build in a Girdled Cage."

As the boat was sinking the captain asked, "Does anyone here know how to pray?"

"I do," answered one man confidently.

"Then," said the captain, "you pray. The rest of us will put on the life belts. We're one short."

Thinking of an attachment for your Caterpillar machine?

Be sure of these points: Is it ruggedly built—as ruggedly built as the big yellow machine it'll work with? Does it attach and detach easily? Is it designed with your operator's safety in mind? Is it *complete*, or will it need special fittings?

CAT* attachments fill the bill every time. They increase operator comfort and convenience—which means increased efficiency. You get *more work* out of your machine.

See your Caterpillar Dealer's Parts Representative for information and catalogs on the complete line of Cat original attachments for your machines.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Cat all-weather steel cabs are tailored to fit exactly your Caterpillar-built Tractor and Motor Grader. Simple to install, yet they afford maximum vision while keeping out wind, snow, sleet, rain and dust.

CATERPILLAR*

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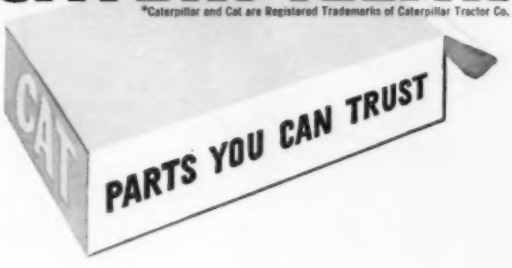
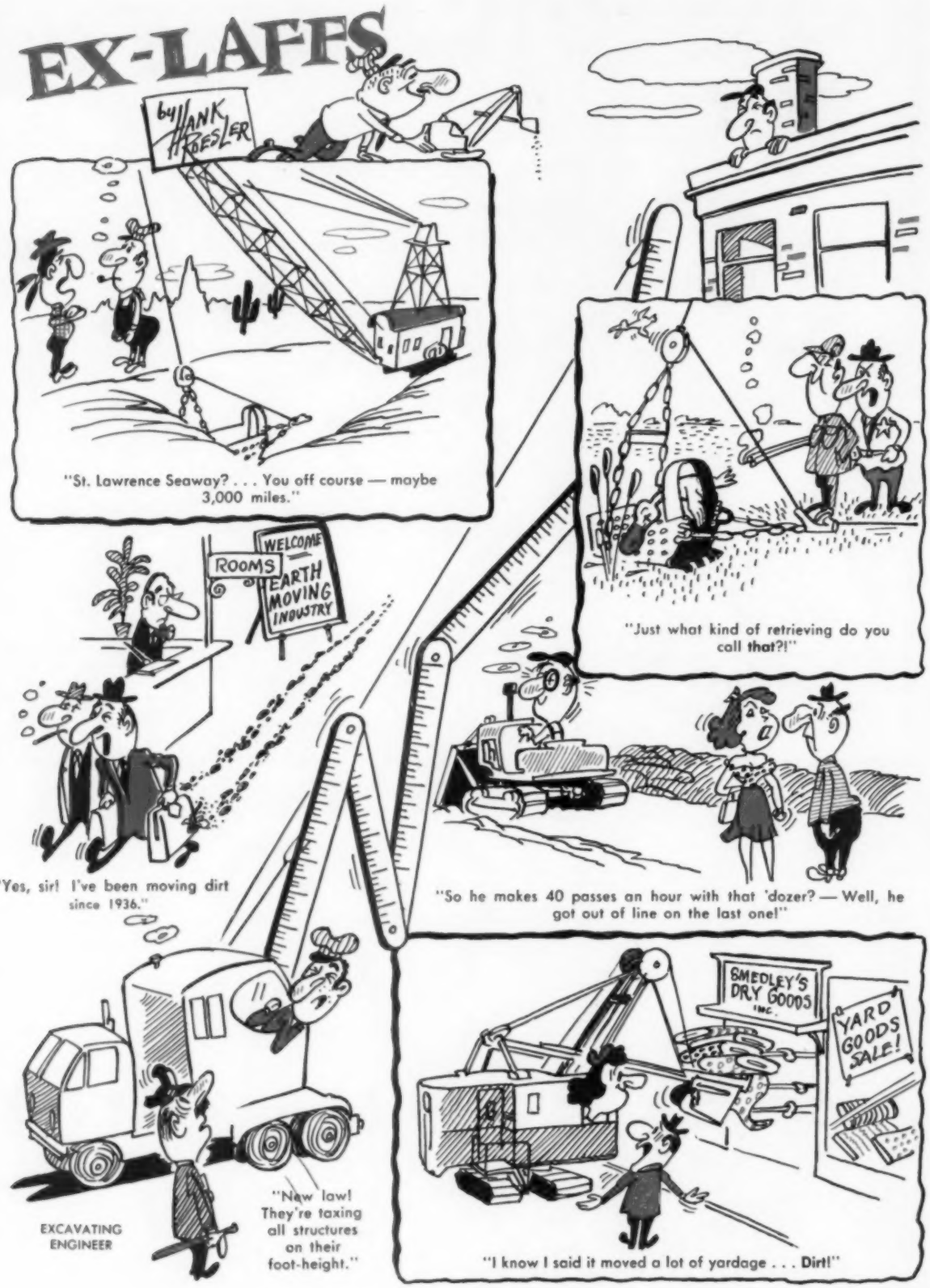


EX-LAFFS


by HANK ROESLER
"St. Lawrence Seaway? . . . You off course — maybe 3,000 miles."
"Just what kind of retrieving do you call that?!"
WELCOME
ROOMS
EARTH MOVING INDUSTRY
"Yes, sir! I've been moving dirt since 1936."
"So he makes 40 passes an hour with that 'dozer? — Well, he got out of line on the last one!"
EXCAVATING ENGINEER
"New law! They're taxing all structures on their foot-height."
SMEDLEY'S DRY GOODS INC.
YARD GOODS SALE!
"I know I said it moved a lot of yardage . . . Dirt!"

Continued from page 42

with the port. On a straight line, the two points are 56 miles apart.

Water must be transported approximately 50 miles by pipeline and aqueduct. A storage reservoir of several days' capacity will be provided.

Toquepala is located at an elevation of 10,600 feet in the Andes mountains. Because of the surrounding mountains, the area is a desert. Temperatures vary from a low of 30° to a high of 85°.

Housing construction is under way. Company towns will be created at the mine and at Ilo. Each area will operate autonomously with its own churches, schools, hospitals, stores and recreational facilities.

Peak employment may reach 4,500 during the initial construction period.

Drilling Symposium

The University of Minnesota will present its sixth annual Drilling Symposium October 11-13 at the Center for Construction Study on the university campus at Minneapolis. The planning committee, composed of mining engineers and mine operators, as well as university faculty members, has chosen the subject of production drilling and blasting for discussion.

The program will begin with a discussion of the principles of drilling and blasting. Drilling and blasting practice in the Lake Superior area and other mining areas will be discussed the following day. An open discussion period will be featured on the final day. The meeting is open to mining engineers, mine operators, drilling contractors and suppliers, and others interested in the subject matter.

Seaway Dredging Contract

The St. Lawrence Seaway Authority has awarded a contract to deepen some four miles of the existing channel of the Welland Ship Canal near Port Colborne, Ont., to the joint venture of McNamara Construction Co., Ltd., and Canadian Dredge and Dock Co., Ltd., both of Toronto. The contract is valued at $11,623,200. The work extends some two and a half miles above Lock 8 at the Lake Erie end of the canal to deep water at Port Colborne breakwater, and for a mile and a half below Lock 8.

The dredging contract includes deepening the approach channels, north and

BITES DEEPER DUMPS FASTER

PROMPT SERVICE AVAILABLE

Factory service on Kiesler Buckets and as an accommodation on other makes, too. Whatever the problem, feel free to call on us.

Whether you need to rehandle or excavate, you will move MORE IN LESS TIME with a KIESLER CLAM SHELL. Our guarantee (see below) is the result of decades of experimentation and factual impartial testing; using *proven* principles of leverage and power and applying that power and leverage to *both* shells the KIESLER CLAM SHELL has more DIGGING-IN ability than any other bucket manufactured. And this digging ability is not dependent on dead weight (counterweights) nor large amounts of cable, hence longer cable life.

Note, too, how little KIESLER shells have to be opened to dump whole load: no "tailing-off" with a KIESLER. This is CONTROLLED DUMPING!

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.

KIESLER
Since 1892

south of Lock 8 of the Welland Ship Canal. It is to be completed by September 1958.

The St. Lawrence Seaway Authority has already awarded three contracts for enlarging the channel of the Welland Ship Canal between Locks 1 and 2, Locks 2 and 3 and Locks 3 and 4. These latter contracts require the work to be done by excavation "in the dry" during the non-navigation seasons of 1956, 1957 and 1958 when these parts of the canal have been dewatered. One of these has already been completed.

For the most part the Welland Ship Canal is 25 feet deep. Required Seaway depth is 27 feet. The work of the canal-dredging contract just awarded entails the removal of some 672,000 cubic yards of material.

Consulting Engineers Form Group

Formation of the Consulting Engineers Council, the first national organization of independent consulting engineers, has been announced following an organizational meeting in Tulsa, Okla.

Acting as a national clearing house for state, regional and local associations of engineering consultants, the council will serve as the national representative of its members in dealing with the federal government and other national professional associations.

Elected as president was John K. M. Pryke, senior partner of Slocum and Fuller, New York consulting firm.

Other officers are C. C. Pate, Tulsa, first vice president; B. M. Dornblatt, New Orleans, La., second vice president; Edward J. Wolff, Chicago, Ill., secretary; and C. E. Becker, St. Louis, Mo., treasurer.

Iron Ore Exploration

Search for additional reserves of iron ore has been extended to Ashland County, Wis., where Jones & Laughlin Steel Corp., Pittsburgh, Pa., has started an exploration program on lands it has optioned.

The properties are located near the village of Butternut and in the township of Agenda. They include approximately 1,600 acres. The acreage is owned by 15 different private individuals.

Options, which terminate at the end of 1957, were negotiated for purchase of some of the properties and for lease of others, if the exploration work indicates iron bodies in economic quantities. Diamond drilling is being done under contract with the E. J. Longyear Co., Minneapolis, Minn.

These new explorations are about 35 miles away from another J&L exploration site on lands owned by Iron County, Wis. The Iron County lands are located in the Pine Lake area north of Mercer. They are being explored under an option agreement initiated in 1955.

The firm's decision to option the Ashland County properties and explore for iron ore was reached after preliminary geophysical surveys indicated the possible presence of economic quantities of magnetic iron formation or taconite which might be recovered by open pit mining.

These low-grade ores, if present in sufficient quantities and if mineral characteristics are favorable, may be beneficiated to produce a high grade concentrate for blast furnace use.

Florida . . .

Continued from page 29

drawl. "We've got good men and good equipment on the job."

The job was Stanton's first on a turnpike. His staff includes Lamar Peterman, engineer; John R. Massey and Joe Brooks, foremen; and Willis Conner and Ben Davis, mechanics.

C. L. Smith is Hooper's general superintendent.

Howard, Needles, Tammen & Bergendoff, a familiar name in the turnpike business, is the consulting engineering firm to the Florida State Turnpike Authority.

Members of the Turnpike Authority include Manuel, Turnbull, W. Howard Frankland, William T. Alsop, Richard H. Simpson and Charles E. Commander, Jr. Jack L. Peters is its attorney.

Soon, these men will be able to sit back and watch northerners gain access to their state's sunshine at a faster, more comfortable and safer pace.

Uranium . . .

Continued from page 39

mostly by Ranite C. Even the jaw plates of the Pioneer crusher have hardfacing protection.

The battle with dust is, of course, constant. A regular Sunday maintenance operation, for example, is a complete

Continued on page 50

Satisfied customer Art Martinson (right), president of Denver's Kitimat Corporation, and Phil Smith, Mack salesman. There's real friendship between these two—and no wonder! Mack diesels are giving Kitimat . . .

100% more fuel mileage

The Martinson Construction Company of Denver, Colorado, leases a fleet of trucks from the Kitimat Corporation. Originally, the trucks were gasoline-powered units averaging 3½ to 4 miles per gallon—real "profit killers." Today, Kitimat operates Mack diesels exclusively and averages 8 miles per gallon—for a saving in fuel costs of more than 100%.

As Kitimat president Art Martinson says, "In 1952 we bought our first Mack diesel and got a real lesson in truck economy and performance. Today, we are 100% Mack—12 mixers, 6 dumpers, and 2 tractors. The fuel savings alone more than justify the higher initial cost of the Macks. Just as important, our Macks give us dependable service, bonus capacities, and lower maintenance costs with a really gratifying minimum of down time."

Why not cut hauling costs and boost your profits with Macks—trucks that are unmatched for operating economy, stamina, and low maintenance? Like other operators, you'll find that you can't afford *not* to operate Macks. For complete information, contact your local Mack Branch or Distributor. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

• • •

MACK
first name for
TRUCKS

At Anaconda's Bluewater reduction plant uranium ore is pulverized and purified into a high-grade final product for shipment.

Uranium . . .

Continued from page 48

round of the machine with a Malsbary steam cleaner which cleans all exposed gears and filters. The filters in the GM Electro Motive unit are cleaned each Sunday by this steam cleaner. Electrical systems on the shovels are cleaned of dust, and constant haul road sprinkling also is intended to keep dust down. Filter replacement is considerably heavier than is normal, say on highway excavating jobs, for the silica dust is abrasive.

According to Mine Superintendent John Herndon, Anaconda's nearly 100% Indian crew on operation and maintenance deserves a great deal of credit for the way they have expressed personal interest in applying themselves to the operation and maintenance of machinery. Very few of the operators had ever operated equipment before, and yet in a few months time these Indians are doing an excellent job. On the P&H shovel is an Indian operator who learned from scratch. In three months time, he now turns out 5,000 tons per shift. The drillers on the rotary drills, who had never seen such a machine before, now turn in up to 1,000 feet per shift. All hands are learning a much better appreciation of the importance of preventive maintenance. Mobile service units make their rounds each shift, and there is a large corrugated iron Quonset repair headquarters—however small it is for a fleet of 17 Euclids—where engine overhaul and heavy repairs can be made.

Camp Site Established

Anaconda also has established a modern camp site at the mine for its employees. About 18 permanent houses now have been constructed, a tennis court has been built, and work has been started on construction of graded streets in the housing area. Two wells have been drilled. Their capacity now totals approximately 35 gpm—enough to serve the camp area.

All field operations at the time this article was written were under the general supervision of J. B. Knaebel, manager of Anaconda's New Mexico mining operations. His assistant was Albert T. Fitch, and John Herndon was mine superintendent at Jackpile. The Jackpile organizational setup included B. F. Barlow and Stanley Whitty, pit foremen; Chet Riddel, shovel foreman; J. W. Roberts, chief mechanic; J. W. Dorsey, maintenance foreman; Homer Peveler, Charles Graham and Howard Graham, truck mechanics; R. B. Schlosser and Barton Cross, production engineers; Floyd Balentine, chief engineer; and Forrest Ableman, underground mining foreman.

Pic[illegible] a Sure Grip . . . .

Bucyrus-Erie Rock Grabs

Bucyrus-Erie Rock Grabs are well worth looking into now. They can greatly increase the work capacity of your crane in handling large rock tonnage. These tough rock-handling units don't have to get their jaws under a load to lift it . . . two approximately parallel side contacts are all that is necessary. The Grab pinches its load and lifts entirely by friction. The jaws, actuated by a multiple-part rope hitch, grip tightly — the heavier the lift, the firmer the grip.

Available in five sizes ranging from 2½ to 20 tons capacity. Investigate all their advantages today!

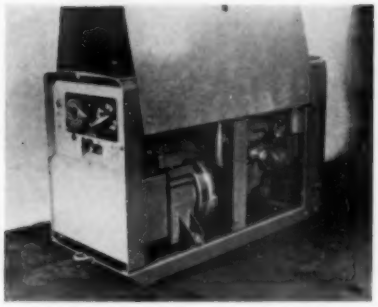
18R56C

BUCYRUS ERIE

South Milwaukee, Wisconsin

Equipment You Ought to Know About

G-E Engine-Driven Welder



Manufacturer: General Electric Co., Schenectady 5, N. Y.

Claims: A new engine driven welder, with battery start and direct coupling between engine and generator, has been announced by the G-E welding department.

Available in 300 and 400-ampere models, the new welder includes reversing switch, battery start and side panels as standard equipment. Built to withstand heavy duty service, the new welder is constructed of extra heavy steel and has no projecting generator or controls that could be damaged in on-the-job operation.

Both 2 and 4-wheel trailers are available to meet varying requirements. The 2-wheel trailer features a small, retractable 12-in. diameter wheel on tow-bar to simplify handling.

Maintenance on the new welder has been considerably simplified. Constant pressure brush springs require no adjustment and sealed bearing on generator eliminates relubrication. An exciter is not required, eliminating extra points of maintenance and servicing.

Gasoline driven models are equipped with Hercules JX4 engines, rated 54 hp at 2,150 rpm. Both the 300 and 400-ampere models have a duty cycle of 60%, rated temperature rise of 50°C, open circuit voltage of 80, and operate at maximum rpm of 2,150.

The 300-ampere unit, designated 30AG, has a welding range of 60 to 375 amperes, and electrode capacity of 3/32-in. to 5/16-in. The 40AG, rated 400 amperes, has an operating range of 80 to 500 amperes, and electrode capacity of 1/8-in. to 3/8-in.

Amsco Electrodes

Manufacturer: American Manganese Steel Div., American Brake Shoe Co., Chicago Heights, Ill.

Claims: A new line of "tube rod" electrodes specially developed for semi-automatic hardfacing has been developed by AMSCO.

Although the tube rods have been designed specifically for use with the AMSCO MF semi-automatic welder, they easily may be adapted for use with most semi-automatic machines.

The new electrodes are 3/32-in. diameter drawn tubular wire and act much like mild steel solid wire in the welding machine. The tube rod is a perfectly round steel-wire shell with the various alloys firmly enclosed within the shell. The steel shell of the wire is work-hardened, preventing any deformation or snarling of the rod during welding.

The tubular construction of the electrodes can be driven by feed rollers found in all semi-automatic hardfacing welders.

Gains offered by the new electrodes include high metal deposition, longer wear life of parts and speed and ease of welding.

Three electrodes are immediately available: S/A manganese; S/A 53; S/A 33.

S/A manganese develops full Hadfield manganese steel properties for all types of manganese steel buildup and repair application. S/A 53 is a "general purpose" hardfacing alloy, high in chromi-

Continued on page 55

40% FASTER THAN ANY OTHER DRILL

● The McCarthy Vertical Auger Drill cuts drilling time in earth, clay, compacted sand and gravel, hard pan, shale, sandstone and rock as much as 40%. Rugged construction permits you to drive 2 to 24-inch augers to depths of as much as 125' faster than any other drill. Get the facts on the powerful McCarthy today. See how you can complete shot hole, exploration drilling, foundation holes, dewatering operations, well drilling, highway construction and heavy contract work faster than ever before. The versatile, vertical McCarthy gives you more than any other drill. Write for Bulletin M-100 now. Let us show you how you can turn new profits on your drilling job.

McCarthy Vertical Auger Drill Model 106-24

SALEM

MANUFACTURED BY

THE SALEM TOOL CO.

799 S. ELLSWORTH AVE.

Heaping load on the bulldozer is easily handled by the Turbocharged D9. Notice all-around visibility from operator's seat—also easy access to controls.

D9 SETS PRODUCTION PACE CROSSING ON SECTION 33, MASSACHUSETTS

A bid of $4,719,719 on Section 33, Massachusetts Turnpike, won the contract for J. F. White Contr. Co., Cambridge, and Consolidated Constr. Co., Attleboro, Mass. Among other work, specifications on this 3.89-mile section called for excavating 1,720,000 cu. yd. of earth, 46,100 of rock and 231,800 of peat, as well as handling 507,800 cu. yd. of borrow and 205,000 of gravel.

In the equipment line-up, there was a fleet of Caterpillar units including a D9, four D8s, two No. 90s, one D6, four DW21s, a No. 12, a No. 212, a D337 and two D13000s in draglines. Here you see the Turbocharged CAT* D9 Tractor with No. 9S load-shape Bulldozer pushing fill into a peat bog.

On this well-planned operation, seven scrapers hauled the fill to the D9. Making round trips of about 4500 feet, the wheel-type DW21-No. 21 Scrapers averaged 15.4 pay yards a trip. On shorter hauls, the crawler-drawn No. 90s averaged 22 pay yards a trip. During its 10-hour day, the D9 set such a fast pace for the scrapers that only occasionally was it necessary to have another 'dozer lend a hand with the fill.

For jobs that call for top production, you can't beat the dirt-moving capacity of the giant D9. For complete facts about the new king of the crawlers, see your nearby Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE D9—NEW KING OF THE CRAWLERS

PEAT BOG TURNPIKE

BIG PRODUCTION FEATURES OF THE D9

First Track-Type Tractor with Turbocharger

The D9's Turbocharger is driven by engine exhaust, utilizing energy which would otherwise be lost. It packs air into the engine according to engine load, *not engine speed, for* more *working horsepower.*

Choice of Torque Converter or Direct Drive

To match the tractor to your job, two types of drive are available: the exclusive Caterpillar Oil Clutch with six-speed transmission (both in forward and reverse) or a three-stage torque converter with three gear ranges.

Completely New 320 HP Engine

The powerful D9 Engine features, in addition to the Turbocharger, a 6¼" bore and 8" stroke and runs at 1240 RPM.

Constant Power Drive for Rear-Mounted Equipment

Power for cable controls, direct from the engine's rear power take-off, makes operation completely independent of flywheel clutch or torque converter, boosts operating efficiency.

Easy to Operate

Hydraulic boosters provide power for steering and braking and master clutch operation. The 7-roller track frame provides excellent stability, flotation and ride. The starting engine has an electric starting system and simple single-lever control for easy and convenient operation from the seat. Fast, sure starts in any weather.

Easy to Service

Oil clutch, torque converter, transmission and steering clutches can each *be removed individually without disturbing other components. Hydraulic track adjusters are among the many other features for fast, easy adjustment.*

Almost singlehanded, the D9 handles all the fill brought up by seven scrapers on Section 33, Massachusetts Turnpike, near Framingham.

Back of the D9, a dragline powered by a Cat D337 Engine scoops peat from bog.

Quebec, Canada . . .

another example of how Bucyrus-Erie rotaries cut costs on blast hole drilling jobs

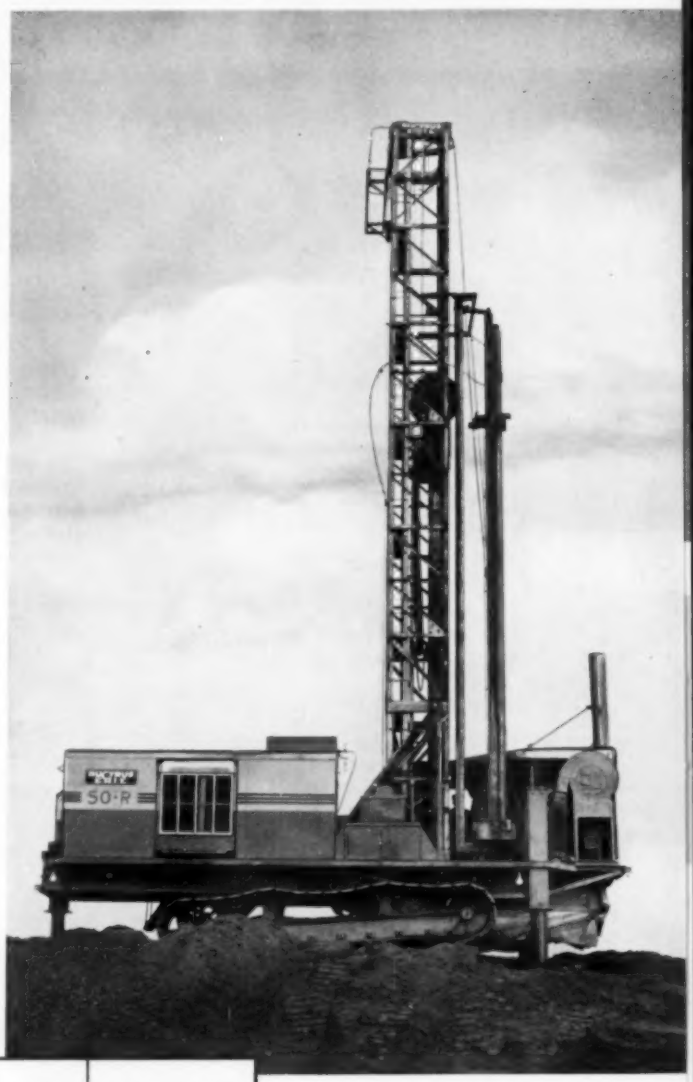
On August 28, 1954, Iron Ore Company of Canada put a Bucyrus-Erie rotary blast hole drill into operation at Knob Lake in Quebec. The material there consists of up to 63% iron and 2½% to 12% silica, with overburden made up mainly of non-formation and dolomites. The iron contains approximately 20% hard iron formation and the balance is limonite and hematite.

After a preliminary survey of the property, the 50-R was tried at three locations. The first of these was on the south ore body where drilling was hard, heavy, and in broken formations and ravelly bands about ½ an inch thick. The second was on the north ore body where drilling was medium hard to soft and the material varied both vertically and horizontally. The third was in a quartzite type of material which resembled sandstone, but was heavier than sandstone because of the impregnation of iron ore. All three locations were within a one-half mile radius.

Results in feet per hour of drilling time were greater than expected. The overall figures are given in the accompanying table.

Due to the impressive performance of this 50-R, Iron Ore Company of Canada has since ordered five more . . . further proof that these drills really pay off. To find out how they can benefit you, write today to BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin. Ask for detailed specifications and illustrated literature.

37856C



PERFORMANCE DATA TABLE

TIME	8/27 - 10/1	10/1 - 11/13	8/27 - 11/13
Footage drilled	5,725'	7,145'	12,870'
No. of holes	177	211	388
Ave. hole depth	32.3	33.8	33.3
No. of days	31	40	71
Ft. per hr.—drilling time	57.0	67.7	62.5
Ft. per shift	184	178	181

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

New Equipment . . .

Continued from page 51

um, specially suited for applications where heavy impact and abrasion are experienced. S/A 33 is an electrode providing a deposit with extremely high abrasion resistance.

LeTourneau-Westinghouse Tractor

Manufacturer: LeTourneau-Westinghouse Co., Peoria, Ill.

Claims: A new two-engine tractor packing a total of 416 hp has been introduced by LeTourneau-Westinghouse. Designated as the Model Twin-C, it weighs more than 40 tons and is capable of speeds up to 20 mph.

The new rubber-tired giant is designed primarily to push load the larger self-propelled scrapers which have come into common use on construction projects during the last year.

A number of design features combine to give the tractor maximum pulling and pushing power from its synchronized twin diesels. Big 6-ft. high, 29.5 x 29 tires provide 2-ft. 5-in. wide ground gripping traction at each wheel to take advantage of the tractor's

weight. Tires are hydro-flated and are equipped with wheel weights. All four wheels are drive wheels with equal weight distribution on each.

With speeds of 20 mph forward and 5.8 mph in reverse, the Twin-C matches the pace of self-propelled scrapers, and can move fast in either direction. Instant response electric controls, exclusive with LeTourneau-Westinghouse, give the huge machine not only positive power steering but also power a unique floating push bowl.

This bowl, a pushing innovation, measures 4 feet high and 7 feet wide and incorporates a special spring loaded mounting which automatically smooths contact between tractor and scraper. To take full advantage of the contact area of the scraper push-block, the big bowl is quickly raised and lowered by instant response electric control. Combined with the shock proof feature, this allows the operator to "feel" the load to determine the best position of his push bowl for a direct line push which will load the scraper quickly.

Dual engine power is completely synchronized with air and electric controls, making the Twin-C extremely easy to operate. A touch of a single hand throttle operates air pressure controls which tune the engines to exact matched speeds. Moving a single lever on a conventional selector shifts both transmissions simultaneously. The big multiple-disc four-wheel air brakes are controlled by one easy-operating pedal.

Steering, which allows all four wheels to apply maximum pushing or pulling power even in the tightest turns, is controlled with a fingertip switch on the instrument panel.

Automatic power-transfer differentials on the Twin-C both front and rear, match pull to traction. In sand, mud and loose materials, this exclusive design differential instantly and automatically transfers the bulk of the power from the engines to the wheels with the best footing.

The Twin-C's power is supplied by two GM 6-71, 208-hp diesels. Transmissions are LeTourneau-Westinghouse air-actuated constant mesh units teamed with single stage torque converters.

Transit-Level

Manufacturer: David White Co., 315 W. Court St., Milwaukee 12, Wis.

Claims: The new improved White No. 3000 universal transit-level offers a precision-built telescope mounting. Accurate optical and mechanical alignment of the telescope is maintained through the use of a ball bearing race and steel center construction. The 12-in. long internal focusing telescope has a coated lens system providing 25-power magnification. A lock and release lever system permits quick change from level to transit. A compass mounting is also provided. Instrument weight is 11 pounds; tripod weight is 9 pounds.

Hensley Ripper

Manufacturer: Hensley Equipment Co., 800 Peralta Ave., San Leandro, Calif.

Claims: A special new heavy-duty ripper has been designed to fit Caterpillar D9 tractors and others of comparable size and horsepower.

Chief features of the new Hensley Model 2000-H ripper is a specially designed wear collar, which provides added protection to the leading edge of the ripper shank.

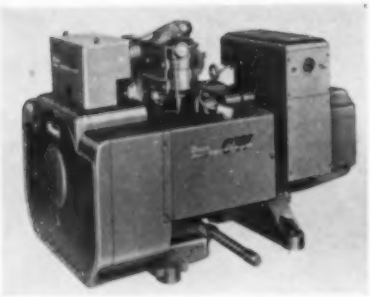
The Model 2000-H ripper is fully adjustable and interchangeable on Cat D9, Allis-Chalmers HD-19 and HD-20, and International TD-24 tractors with blade heights varying from 39 to 61 inches. Despite its size, it is lightweight, making installation and removal exceptionally easy.

Other features include replaceable, reversible, self-sharpening wear boots; positive locking and holding yoke; simple cotter pin rough adjustment arrangement plus ball and socket fine adjustment; and a throat opening that cannot chip the cutting edge or break off hardfacing.

Onan Generating Plant

Manufacturer: D. W. Onan & Sons, Inc., Minneapolis, Minn.

Claims: Onan announces a new 7,500-watt A.C. air-cooled, gasoline-powered electric generating plant. Patterned after the CW series which has been available in 5KW and 10KW capacities,



the new plant (705CW) features the Vacu-Flo vacuum cooling system.

The cooling system employs a powerful centrifugal blower that pulls cooling air through the generator and over the heated engine parts, then expels the heated air through a duct to the outside.

The 705CW can be installed in completely enclosed compartments in a space just slightly larger than the unit and its accessories, with allowances for air-intake vent and exhaust outlet.

Readily trailer-mounted, or available on a skid or dolly, the 705CW also can be equipped with a heavy-duty, 16-gauge sheet steel weatherproof housing.

Prime mover for the 705CW is an Onan, two-cylinder opposed, 4-cycle engine of 20 hp. The unit has forged steel crankshaft and rods, extra large bearing surfaces, full pressure lubrication, copper mesh air cleaner, Stellite-faced valves and seat inserts.

The inherently regulated generator is of the four-pole, self-excited single ball-bearing type, directly connected to the engine to assure permanent alignment. Of drip-proof design, the generator provides a 12-volt battery charging output and is vacuum-cooled by the main engine blower.

A complete line of accessories has been specially designed for the 705CW.

D9 Hydraulic Ripper

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

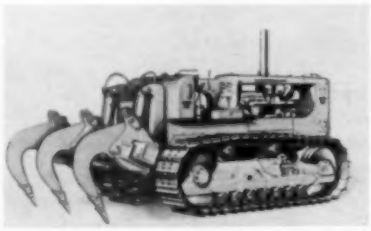
Claims: Caterpillar announces a new tractor-mounted ripper designed especially for use with the Cat D9 tractor. It will be called the No. 9 ripper.

The complete ripper consists of two mounting brackets, two hydraulic cylinders, one beam assembly and three teeth. It weighs 10,830 lbs. The Ripper mounts on the bevel gear case through a special drawbar bracket group which replaces the standard drawbar brackets. The No. 9 is operated hydraulically by two hydraulic cylinders working in conjunction with the Caterpillar No. 50 hydraulic control. Maximum ripping depth is 28 inches.

The box-section beam, 12 inches x 12½ inches x 10 feet 7¼ inches is made of alloy steel plates, submerged arc welded for high quality welds, and reinforced inside by additional plates.

The shanks are made of heat-treated steel. Each shank has a hardened alloy cast steel boot which has a replaceable, hardened cast steel point. The teeth are swivel mounted. They will swivel up to 10°.

The No. 9 ripper is driven from a "live drive" hydraulic pump which permits the ripper to be raised and lowered



independently of the flywheel clutch or torque converter. A convenient control feature is the automatic kickout which throws the hydraulic control lever back to "hold" position at the end of the "raise" stroke.

Down pressure available to the ripper is equal to the weight of the rear of the tractor. If the operator desires, he can easily reach and maintain the maximum ripping depth.

The ripper is used primarily to break up hard materials for subsequent scraper loading.

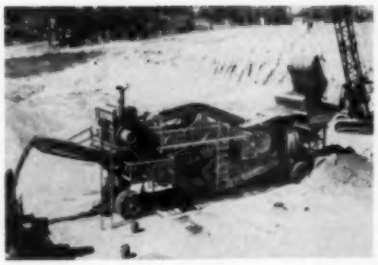
Redesigned Junior Tandem

Manufacturer: Iowa Mfg. Co., Cedar Rapids, Iowa.

Claims: Iowa Manufacturing has redesigned the Cedarapids Junior Tandem crushing and screening plant to increase its capacity and versatility.

A larger screening area is one of the features on the redesigned Junior Tandem. A half deck has been added to the horizontal vibrating screen. The screen width has been increased by six inches over the old model. The 42-in. x 10-ft. 2½ deck section screen on the Junior Tandem not only increases screening capacity but also adds flexibility for producing from one to three products simultaneously in sizes ranging from 2-in. road ballast down to minus ¼-in.

The owner can choose the crusher sizes that will best fit his particular pit



conditions. Where large amounts of oversize are encountered, the 10-in. x 36-in. jaw crusher may be used for the extra primary capacity necessary to keep the plant operating at peak capacity. In average pit conditions, the 10-in. x 24-in. jaw crusher handles primary reduction.

Secondary crushing is handled by either a 24-in. x 16-in. or a 30-in. x 18-in. roll crusher. For average conditions in the pit, the capacity of the smaller secondary crusher is adequate for balanced plant operation.

Crusher sizes can be matched or mixed in any combination to adapt the junior tandem to whatever crushing conditions are encountered.

Generator Plant

Manufacturer: Wincharger Corp., Sioux City 2, Iowa.

Claims: An idling control that reduces the engine to idling speed with a flick of a lever is featured on the new Winco, 2,500-watt direct-drive engine-generator. Purpose of the new control, called the CONSERV-er, is to save fuel, extend engine life and lower maintenance cost. The CONSERV-er is known as the Series 205B14S2D and has just gone into production, according to the manufacturer.

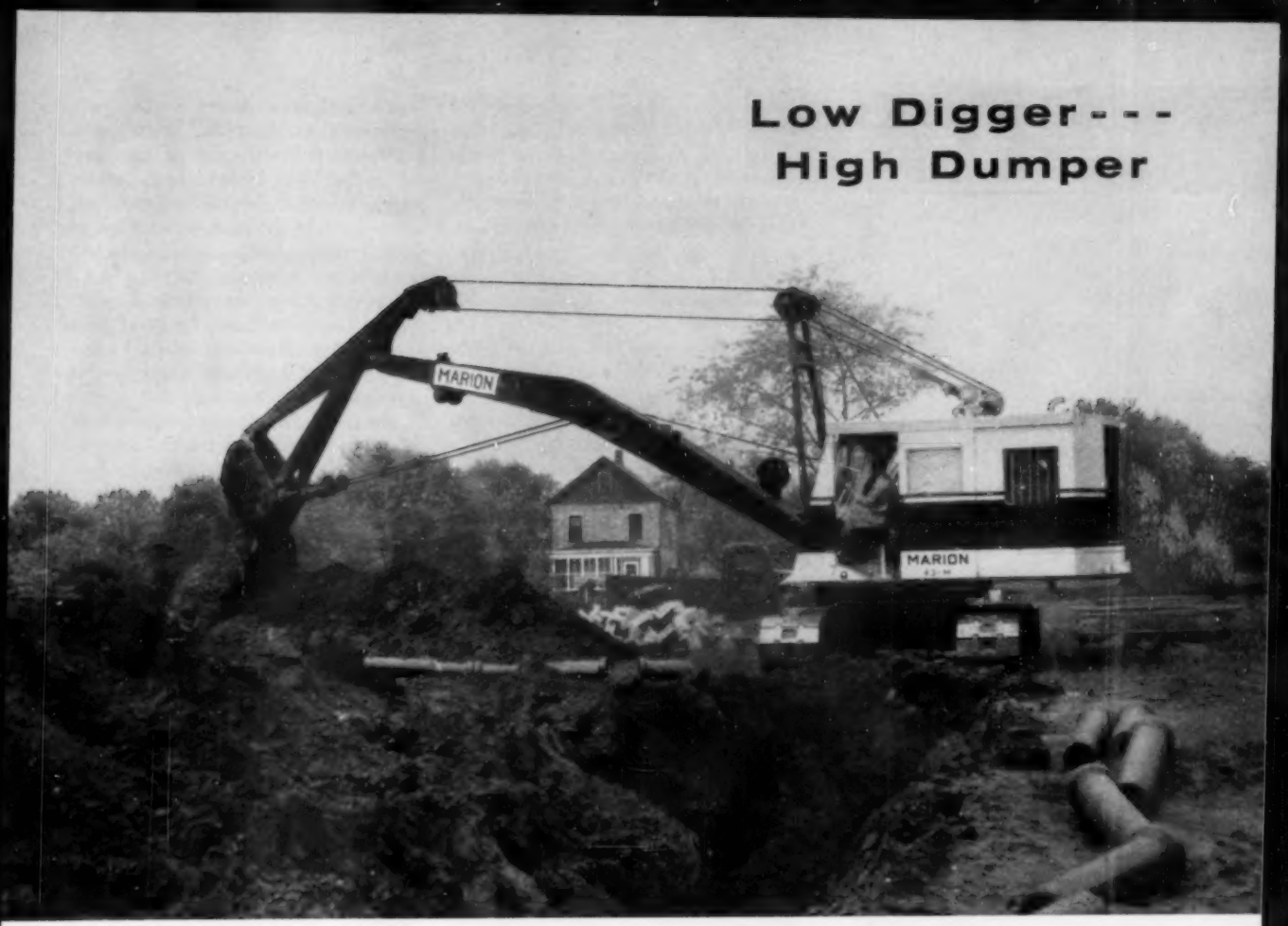
Optional features include a large generator designed to give unusually close, steady voltage regulation, and an indicator pilot light. Also available as optional equipment are the Winco two-wheeled Speedy-Shift dolly and a retractable starter.

Bros Rock Breaker

Manufacturer: Wm. Bros. Boiler & Mfg. Co., Road Machinery Div., Minneapolis 14, Minn.

Claims: A new in-place materials reducer breaks down all types of native rock to minus 2-in. size aggregates right on the roadbed. Named the Bros Prepa-

Continued on page 58



1-Yard Hoe Keeps Jersey Job Moving

Sewer lines for a New Jersey housing project moved rapidly and smoothly, with a one-yard Marion hoe on the job.

The low-digging, high-dumping Marion 43-M kept a crew of 10 follow-up workers busy on a fast schedule. The Marion cut a 7-foot trench 4 feet wide and nearly half a mile long.

The long, gooseneck boom of the 43-M helps it swing clean, dribble-free loads into the highest trucks and return quickly to deep cuts in smooth, fast cycles.

Marion air controls make it easy for an operator to look good on the job. This operator calls the 43-M the finest he has seen in 10 years of shovel running. See your Marion Distributor about low-digging, high-dumping help for your next job.

Whatever your job requirement, there is a Marion machine of the right size and type for greatest efficiency

MACHINE	SHOVEL CAP. IN CU. YDS.	HOE CAP. IN CU. YDS.	CRANE RATINGS			ASK FOR BULLETIN NO.
			CRAWLER MOUNT MAX.* STABILITY	CRAWLER MOUNT MAX. USABLE	TRUCK MOUNT MAX. USABLE	
MARION 35-M	¾	¾	18T @ 10′	18T @ 10′	25T @ 10′	431
MARION 43-M	1	1-1¼	27T @ 10′	20T @ 12′	35T @ 15′	430
MARION 362	1½	1½-2	43T @ 12′	30T @ 15′		398-D
MARION 87-M	Special Crane		150T @ 12′	75T @ 15′		—
MARION 93-M	2½	—	80T @ 12′	50T @ 15′		397-F
MARION 101-M	3	—	84T @ 12′	57T @ 15′		417-A
MARION 111-M	4	—	169T @ 12′	105T @ 15′		402-C

For Comparison Purposes Only

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

Please send me Bulletin 430 on the Marion 43-M.

Name ..... Title .....

Company .....

Address .....

City ..... State .....

New Equipment . . .

Continued from page 56

rator, this new machine breaks over-size materials by impact hammers at a production rate up to 400 cubic yards per hour.

Material up to 30-in. diameter is battered by 22 free-swinging hammers of special alloy steel. The hammers are mounted on a common shaft and driven by a poly V-belt drive direct from engine.

The hammers work-harden during breaking operations and wear slowly. Over 1,000 hours have been recorded on one set of hammers. When finally worn, hammers are quickly and easily removed and replaced by a specially engineered hammer assembling method.

Besides reducing native rock deposits, pit-run gravel and over-size quarry rock, the Preparator can be used to pulverize old blacktop paving for re-use. It can be drawn by any tractor with 30 hp or more. Best towing speed is 1 to 1½ mph. It is available with either gas or diesel engine.

H-5, H-3 Attachments

Manufacturer: Bucyrus-Erie Co., South Milwaukee, Wis.

Claims: Bucyrus-Erie has announced a new ¾-yd. clamshell-type materials handling bucket for use with the truck-mounted, all-hydraulic H-5 Hydrocrane; and a new auger attachment for use on the H-3 and H-5 Hydrocranes. Also, the company now is offering its H-3 Hydrocrane-Hydrohoe with a dual-purpose engine which serves not only as the machine's power unit but also furnishes air for operating jack hammers, air spades, tampers, evacuators and similar tools.

The ¾-yd. clamshell-type materials handling bucket (pictured) for the H-5 is designed for handling coal, sand, gravel and other bulk materials. It is faster operating (both closing and opening) than conventional cable-operated buckets because foot-controlled selector valves enable the operator to channel all of the machine's available horsepower into the digging action.

With two double acting hydraulic rams forcing the bucket bowls closed, Bucyrus-Erie claims that penetration is better and payloads bigger because the bucket digs in with its full weight. No digging effort is lost through the hoisting action required to close cable-operated buckets. The lower ends of the rams are attached directly to the upper edge of the bowl sections. Because the dual rams—one for each bowl—never extend into the bucket, there is no load interference. Use of twin rams, coupled with improved leverage, provides added force to the lips at the point of closing.

Bowls of the bucket are interchangeable with those of the ½-yd. digging bucket. To assist in picking up loose

material and for light digging service, a set of five high carbon forged teeth can be furnished as extra equipment.

To speed bucket changes, the tagline hose connection is equipped with a quick-disconnect coupling. The bucket can be attached or detached in a few seconds without the use of tools and without oil spillage.

The new auger attachment for the H-3 and H-5 drills holes up to 28 inches in diameter, the manufacturer says. Maximum depth capacity is 40 feet.

The attachment consists of the cutter head, 4-ft. auger flight sections, a hydraulic motor and gear box, a torque arm extending from motor bracket to boom, and drain hose.

Both vertical and horizontal boring jobs can be handled with the auger. Among the vertical boring applications are utilities work, fence posts, pilings, footings, elevator shafts, outdoor advertising signs, hydraulic grease racks and foundation underpinning. Horizontal applications include work under streets, sidewalks, lawns, driveways and railroad tracks for such installations as water mains, sewers, gas mains, electric conduits and telephone conduits.

Auger diameters range from 3 to 28 inches. The cutter heads are fitted with long-wearing, sharp carboloy teeth. Specially designed heads for drilling various types of materials are available.

The new dual-purpose engine now offered optionally with the H-3 Hydrocrane-Hydrohoe is a 6-cylinder gasoline Chrysler Industrial Model 22. Three cylinders of the six are used to develop power; the other three serve as a compressor delivering air at the rate of 120 cfm at 100 psi.

The compressor is equipped with an after cooler which reduces the temperature of the air. An air receiver tank with hose reel is included in the package. Engine parts and service are available at Dodge truck dealers.

Hydraulic Pipeline Dredge

Manufacturer: Ellicott Machine Corp., Baltimore, Md.

Claims: A newly developed Ellicott hydraulic pipeline dredge features the ability to work where other floating dredges cannot.

The dredge, especially designed for the digging and maintenance of narrow canals, channels and irrigation ditches or for any dredging job where maneuverability and small size are essential, comes in 6, 8, 10 and 12-in. sizes. The smallest model, whose reinforced stress-resistant steel hull is 28 feet long, 11 feet wide and 3 feet deep, can work in close quarters only slightly wider than its own width, as can the dredges of the larger sizes. All of these machines dig their own flotation and low superstructure permits passing into areas formerly inaccessible to hydraulic dredges.

One of the most important new features of these canal "Dragon" dredges is their complete hydraulic control for all operations from a single control panel, requiring the services of a one-man crew. The hydraulic circuit is made up of one dual hydraulic pump, five fluid motors and nine hydraulic cylinders. A diesel engine supplies prime power to the dredging pump and the hydraulic pump, which provides a system pressure of 2,000 psi at the maxi-

mum. The machines have horsepowers varying from 60 to 200, depending on their size.

Characterized as a swinging ladder type dredge, the ladder assembly is attached in such a manner that, in addition to vertical movement, it also swings laterally. This new feature eliminates the great width needed for the entire dredge to swing in making the arc of a cut and permits the canal "Dragon's" hull to remain stationary. Positive control of the ladder movement insures an accurate cross section and smooth canal contour.

Another unusual design characteristic is the equipping of the dredge with four spuds instead of the usual two. With an arrangement of two forward walking spuds on the bow, one at the stern and one at the starboard side to assist in moving around the curves, the dredges have greatly increased stability and maneuverability.

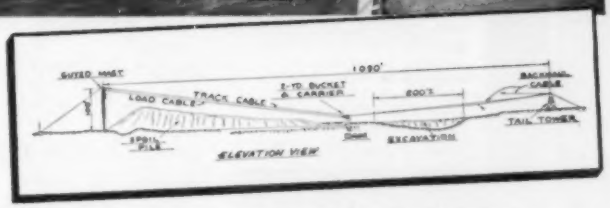
A completely self-contained unit, the canal "Dragon" needs no auxiliary mo-

tive equipment or assistance from the land near the waterway where it is working. The 6-in. canal dredge can dig 30 to 60 cubic yards per hour, depending on the type of material being moved. It can transport this material at the side of the channel or up to 200 feet away. The larger size canal dredges have correspondingly larger work capacities.

The dredge is equipped with a suspended discharge pipe, which allows material to be placed behind a berm at the side of the canal without additional pipeline. Elevated 13 feet above the water line, the reach of the pipe from the side of the dredge is 25 feet. The discharge pipe can also function as a rudder. By placing the intake pipe in the water, the pump can eject the water with sufficient force to move the machine and with the discharge pipe operating on a swivel, the dredge becomes self-propelled and guided.

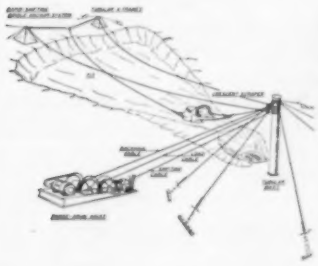
Three Sauerman Methods for Cutting Excavating and Reclamation Costs

DIGGING and CLEARING



Slackline Cableway—A 2-yd. bucket is used to maintain a clear channel to an irrigation project. The cableway digs the hard packed silt and conveys it to a spoil pile on the downstream side of the dam. Method permits removal of silt without wasting water.—*Sauerman News No. 146.*

RECLAMATION TO HOPPER



DragScraper—A 4-cu. yd. DragScraper digs sand and gravel from a wet pit and hauls it 400 ft. to grizzly hopper. This new machine handles increased plant demands in one shift. Two were required with the former installation.

—*Sauerman News No. 144.*

UNDERWATER TRENCHING

DragScraper and Crane—Here's how a DragScraper used with a carrier and track cable can extend the reach of any crane. This arrangement was highly successful in digging a trench for underwater pipe and backfilling after pipe was laid. —*Crane-DragScraper information is available in Field Report No. 228.*

Find out what the Sauerman Method can do for you

Give us details on your operation. Our engineers will give prompt recommendations and work with you to provide the best method for your requirements. Ask for Catalogs A (DragScrapers) and C (Slackline Cableways).

SAUERMAN BROS., INC. 622 SO. 28th AVE. BELLWOOD, ILL. Cable: CABEX—Bellwood, Ill

Crescent Scrapers • Slackline and Toutline Cableways • Durolite Blocks

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New Trade Literature

Subject: **Pump Bulletin**

Content: A new bulletin covering the complete line of class CRV cradle-mounted centrifugal pumps has been issued by Ingersoll-Rand. Pumps described have capacities from 5 to 2,800 gpm and pressures of 10 to 525 feet total head. A concise tabulation of pump types with their rating enables the pump user to select the correct unit for his needs. A cross section view points up the design features common to this line of pumps. The various models are described and their applications listed on individual pages of the bulletin. Typical installation views of the models are shown. In addition, performance tables and dimensions for the entire line are shown. Ask for form 7223-B.

Where to get: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. or branch offices.

Subject: **Cat DW20 Tractor**

Content: Concise performance and cost data on the Caterpillar DW20 Tractor and matched equipment is contained in a 16-page booklet. It considers Caterpillar's new lowbowl scraper design, and the improved loading rate typical of this scraper is illustrated by curves. Performance characteristics of the tractor are discussed with charts pointing out the speeds and rimpulls that the DW20 is capable of attaining. The booklet also provides a simple, accurate guide to figuring ownership and operating costs with blank spaces for adjusting to specific local conditions. The booklet is also available in French, Spanish and Portuguese. Ask for form DE 6150.

Where to get: Caterpillar Tractor Co., Peoria, Ill., or Caterpillar dealers.

Subject: **Detroit Diesel Handbook**

Content: A handy reference booklet listing over 1,000 models of construction and industrial equipment now available with Detroit Diesel engines as standard or optional power has been released by General Motors' Detroit Diesel Engine Div. With engines in the Detroit Diesel line available from 30 to 893 hp, the models listed range from small pumps to giant excavators and earthmoving vehicles. Over 150 manufacturers are represented.

Where to get: Detroit Diesel distributors and dealers or Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.

Subject: **Tiger Brand Wire Rope**

Content: An 86-page illustrated catalog describes the various classifications of Tiger Brand wire rope and illustrates typical applications. Specification tables are provided for each classification. Wire rope fittings and lubricants are discussed in separate sections. Six pages of information are offered on how to handle and care for wire rope. A listing of terms commonly used by those who work with wire rope is contained in a special glossary section.

Where to get: American Steel & Wire Div., United States Steel Corp., Cleveland 13, Ohio.

Subject: **International Payscraper**

Content: International Harvester's new Model 75 Payscraper is described in an eight-page, two-color mailing folder. Listing a lower-draft frame, much greater visibility, new long-life cerametallic clutch facings, a higher apron lift, bigger push-block, and an improved ejector as highlights of the new unit, the folder has 27 different illustrations of the "75" and its component parts. Capacity is given as 20 cubic yards, without sideboards. The model features a straight-back bowl. Top speed is rated at 24 mph, powered by a 262-hp Cummins diesel turbo-charged engine. Ask for booklet CR-585-F.

Where to get: Consumer Relations Dept., International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Steel Sheet Piling**

Content: Specifications and uses of lightweight steel sheet piling for protection of light-load excavations are explained in a new four-page bulletin. The piece shows how the piling, which can be rented or bought from Foster, can be reused repeatedly for shore protection, sump pits, pier protection, sewer trenches, core wells, abutments, bulkheads, cut-off walls, cofferdams and building excavations. The exclusive Foster box-type corrugation design and interlock design, which permits easy driving and pulling, are illustrated. Driving heads, for use with standard airhammers, and pulling tongs are also described.

Where to get: L. B. Foster Co., P. O. Box 1647, Pittsburgh 30, Pa.

Subject: **A-C Earthmoving Equipment**

Content: Two new 16-page bulletins feature the new Allis-Chalmers TS-260 motor scraper and the HD-11 diesel-powered tractor. Engine, power train, steering, braking and other components of the motor scraper, which has a struck capacity of 11 cubic yards and a heaped capacity of 14 cubic yards, are described and illustrated in catalog MS-1105. A series of assembly and parts photographs gives highlights of the design and operation of the 75-hp HD-11 tractor in catalog MS-100.

Where to get: Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Subject: **Safety Film Catalog**

Content: The 1956 *National Directory of Safety Films* is now available from the National Safety Council. The directory provides a compact source of information on films on safety, first aid, fire prevention and civil defense. It describes more than 1,200 films that are available without restriction on distribution. Information includes

millimeter, running time, color, year of production and a brief summary of the plot. Many of the films are cleared for television and some for theatrical distribution. Each film is available for purchase, rental, loan or long-term lease from one or more of 292 distributors. The directory includes a separate listing for those organizations which limit distribution to specific areas in the United States and Canada. These distributors usually make films available for loan or low-cost rental and are excellent sources for public safety films. A single copy of the directory costs $1.

Where to get: National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Subject: **Wire Rope Sheaves**

Content: A 2-page bulletin lists specifications for the Sauerman line of Durolite wire rope sheaves. Sizes range from 6 inches to 24 inches. The sheaves are a basic part of Sauerman Durolite wire rope blocks and are now available as replacements in other blocks.

Where to get: Sauerman Bros., Inc., 622 S. 28th Ave., Bellwood, Ill.

Subject: **Diesel Engines**

Content: "What is a diesel engine? What are the principal differences between diesel and gasoline engines? How do diesels operate?" The answers to these and many other questions about diesel engines are contained in a 24-page booklet entitled *Answers To Questions About Diesels*. Fully illustrated, the booklet is designed to acquaint the reader with the basic principles of diesel operation. Each question is asked and answered in simple, non-technical terms.

Where to get: Cummins Engine Co., Inc., Columbus, Ind., or distributors.

Subject: **Tandem Rollers**

Content: A 16-page bulletin on its new line of medium and large-sized tandem rollers with torque converter and two-speed transmission is offered by Huber-Warco. With cross-sections, cutaways, diagrams and photos, the bulletin points out features of the reinforced, all-welded frame; the final drive assembly which is mounted in the frame rather than on it; Huber-Warco's combination of a torque converter, tail shaft governor, and two-speed transmission; the adjustable guide roll assembly; the removable kingpin housing; all-welded, watertight rolls; clean-air cooling and ventilating; two completely independent braking systems; variable speed hydraulic steering; dual controls; accessibility for servicing; and close curb clearance. Special emphasis is given to a graphic explanation on how the company's combination of a torque converter tail shaft governor, and two-speed transmission improves tandem performance. Ask for bulletin HWT-525.

Where to get: Huber-Warco Co., Marion, Ohio, or distributors.

Subject: **Armco Tunnel Structures**

Content: An illustrated folder describes the use of Multi-Plate and Liner Plate for aggregate tunnels. Multi-Plate structures are reported to provide the most economical tunnel for aggregate conveyors, while Liner Plate tunnels offer a wide adaptability for installing gates and conveyor equipment. The folder shows actual installations, and gauge tables for both materials are included. Ask for form CS-9456.

Where to get: Product Information Service, Armco Drainage & Metal Products, Inc., Middletown, Ohio.

Subject: **Bituminous Mix Plants**

Content: A trio of eight-page bulletins contains information about three sizes of Pioneer Continuflo bituminous mix plants. Subject of bulletin 619A is the Model 51 plant with a capacity of from 40 to 60 cubic yards per hour; bulletin 653A, the Model 81 plant rated at from 60 to 80 cubic yards per hour; and bulletin 658, the Model 102 with production ranging up to 150 cubic yards per hour. The flow of material through each of the plants is illustrated by large, four-page cutaway spreads.

Where to get: Pioneer Engineering Works, Inc., Minneapolis 13, Minn., and distributors.

Subject: **Concrete Forms.**

Content: Uses of Atlas Compo forms for various types of concrete structures are outlined in a new catalog issued by Irvington Form and Tank Corp. Illustrations show how the forms are assembled.

Where to get: Irvington Form & Tank Corp., 20 Vesey St., New York, N. Y.

Subject: **Foundations Textbook**

Content: *Foundations Design and Practice* by Elwyn E. Seelye, is a convenient single volume work providing up-to-date information on all phases of foundation work, including exploration, inspection, foundation reports, specifications, estimates, contracts and design. Broad in scope, the book covers such topics as soil mechanics, footings, retaining walls, bridge piers and abutments, conduits and culverts, embankments and pavements, and foundations of dams and reservoirs. The author begins with elementary material and then goes on to give the do's and don'ts of successful design and practice. Throughout the book numerous drawings, tables and graphs clarify the text material. Price is $16.

Where to get: John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

Subject: **Electric Plants**

Content: An eight-page manual describes electric plants offered by International Fermont Machinery Co. Powered by internal combustion engines, the electric plants, ranging in capacity from 5 kw thru 250 kw, are designed for automatic or manual starting. The manual includes reference material, forms, and check lists useful to architects, engineers and contractors. Ask for Bulletin No. 955.

Where to get: International Fermont Machinery Co., Ramapo, N. Y.

STANDS UP TO SEVERE USE

and even abuse

One word describes a Hayward — *ruggedness*. Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

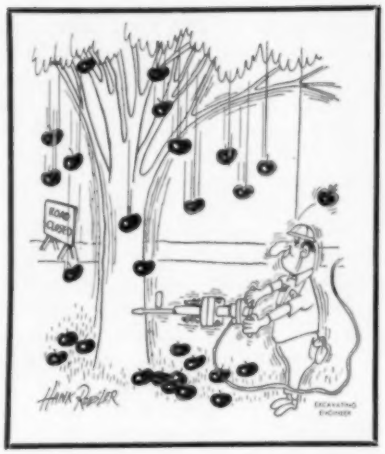
famous for performance since 1888

Notes from the Manufacturers

American Hoist & Derrick Co., St. Paul 1, Minn., has appointed Percy S. Gough as sales manager of the Crosby-Laughlin Div. He will be responsible for merchandising the complete line of drop forged fittings for wire rope and chain manufactured by the division.

Atlas Powder Co., Wilmington 99, Del., has formed a new sales development section in its explosives sales department. Heading the new section is William T. Mahood, formerly manager of the department's contractors section. Assigned to the new group are John L. Romig, quarry and metal mining industry manager; John M. Jeffries, coal mining and stripping industry manager; John W. Cochran, seismograph industry manager, with headquarters at Joplin, Mo.; and Joseph H. Dannenberg, sales promotion and advertising manager.

Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Lima, Ohio, has appointed four distributors for Lima shovels, cranes, draglines and pull shovels. Ray Long Equipment Inc., 820 Blossom St., Columbia, S. C., will cover the entire state of South Carolina. Emmett C. Watson Co., Inc., 310 E. Brandeis St., Louisville, Ky., will cover the entire state of Kentucky with the exception of Boone, Kenton, Campbell, McCreary, Whitley and Bell counties. Evans Engine & Equipment Co., 1230 Westlake N., Seattle, Wash., will cover the western half of the state of Washington and the entire territory of Alaska. Reno Equipment Sales Co., 1700 West St., Reno, Nev., will cover the entire state of Nevada with the exception of Lincoln and Clark counties. The territory also will include Mono County in California.



Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich., has named Clyde W. Truxell, former works manager of the diesel engine division, as general manager. He succeeds Semon E. Knudsen who is now general manager of GM's Pontiac Motor Div. Truxell joined General Motors in 1932 as a research staff member. He came to Detroit Diesel as a chief engineer when the division was established in 1937.

Euclid Div., General Motors Corp., Cleveland 17, Ohio, has appointed Spencer T. (Wyndy) Wyndham district sales representative in the territories covered by P. L. Crooks & Co. in Oregon and Washington; Evans Engine & Equipment Co., in Washington and Alaska; and Dietrich-Collins Equipment Ltd., in British Columbia and the Yukon Territory. Wyndham will make his headquarters at 12844 Shorecrest Dr., Seattle 66, Wash.

L. B. Foster Co., Pittsburgh, Pa., has announced transfer of its Atlanta (Ga.) warehousing facilities from its present seven acre area to a new 18-acre site to permit stocking larger quantities of pipe, rail and piling. Included on the site are facilities for reconditioning piling and rail and for cutting structural grade pipe to customer specifications. Eventually over two miles of rail trackage will be laid to expedite storage and shipping. Located six miles north of Atlanta and one-half mile west of the four-lane Beauford highway now being con-

BUCKET FULL OF PROFIT!
Omaha Dragline Buckets eliminate unnecessary weight which makes room for a bigger payload. A high arch gives more clearance for digging and dumping. Nearly 50 years of "know-how" enables Omaha Dragline Buckets to pass all actual field tests. You can't buy a better bucket!
Write today for catalog giving specifications for four types available.
OMAHA
DRAGLINE BUCKET
DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

structed, the warehouse will stock rail and track accessories, both new and structural grade pipe, steel sheet piling, foundation pipe piling and H-bearing piling.

General Electric Co., Metallurgical Products Dept., Detroit 32, Mich., has appointed Voto Manufacturers Sales Co., Inc., Steubenville, Ohio, as distributor for Carboloy carbide mining tools. The firm will handle the standard line of Carboloy carbide roof drills, coal auger, universal mining machine cutter and finger bits, as well as special carbide mining tools and standard masonry drills.

Koehring Co., Milwaukee, Wis., has announced the merger to it of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, a manufacturer of metal working presses, plastic injection molding and die casting machines, hydraulic components and metal baling and steeping presses.

Leschen Wire Rope Div., H. K. Porter Co., Inc., has appointed Karl F. Ewerhardt as assistant general sales manager. Ewerhardt previously was advertising manager of the division.

LeTourneau-Westinghouse Co., Peoria, Ill., has appointed Contractors Equipment and Truck Co., Inc., 780 E. Third St., Lexington, Ky., as Kentucky distributor for the complete line of LeTourneau-Westinghouse equipment, including the motor graders and TraveLoaders manufactured by its Adams Div. All Kentucky counties will be served except Kenton, Campbell and Boone. Contractors Equipment and Truck Co. has a branch at 4427 Poplar Level Rd., Louisville.

Macwhyte Co., Kenosha, Wis., has appointed Goodwin Johnston to the newly created position of director of purchases. Johnston is the firm's secretary and treasurer. William R. Kuessow has been appointed Macwhyte's office manager.

Timken Roller Bearing Co., Canton 6, Ohio, has announced that A. R. Attebury, who recently retired as district manager for the Steel and Tube Div. in New York, would be retained as a sales consultant specializing in Timken pressure tubing.

SAFETY'S ALWAYS IN SIGHT

Ever worried about your crew forgetting the rated capacity of a block? You're free from worry and they're free from danger with Crosby* "Load-Rated" Blocks because the load capacity is *embossed* in the side plates! A quick glance shows what the limits are—no chance to overload the block by mistake. Crews the world over are protected by genuine Crosby "Load-Rated" Blocks—are yours?

*REGISTERED TRADEMARK

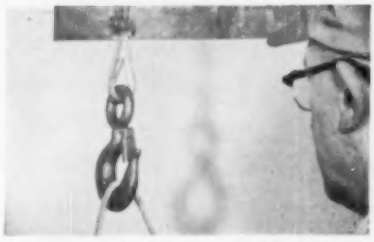
THE RIGHT COMBINATION

An exacting combination of design, steel and drop forging goes into Laughlin Shackles. A combination that results in maximum strength without brittleness that can result in fracture under shock load or in extreme cold! Pins used in Laughlin Shackles are forged from the same high quality steel—their extra hefty design makes them safer when shock loads accidently occur. When you see the famous Laughlin trade mark on shackles (and all other Laughlin fittings), you're seeing the mark of safety! Your nearby distributor has shackles in sizes from 3/16" to 3".

Double Clevis Link attaches 1/4" to 1/2" chain to rings, end and sling links, eye hooks, pad eyes, tractor eye bolts and other fittings.

The world's most complete line of fittings for chain and wire rope is described in the catalog available from your distributor.

LOADS STAY PUT!



Anyway you handle it—rough or easy—your load won't come off a Laughlin Safety Hook until *you* release it! The hook is drop forged and heat treated. The fool-proof latch mechanism is made of long life stainless steel or bronze—it'll never rust, never jam! See your Crosby-Laughlin distributor for information on sizes and capacities.

LAUGHLIN LINKS INSTALLED QUICKLY

Lower downtime—fast changeover is reported by companies using super safe Laughlin Double Clevis Links to couple standard and alloy chains to fittings. Users everywhere have cut out expensive, time-consuming welding and blacksmithing in favor of simple installation. Laughlin's heat treated

Stocked and sold by leading distributors everywhere

CROSBY-LAUGHLIN *Division*

American Hoist and Derrick Company

FORT WAYNE 1, INDIANA

FULL-FEEL CONTROL ANSWERS NEED OF NORTH CAROLINA CONTRACTOR

Extreme precision and flexibility were needed to perform a special job during construction of Northwest High School in Charlotte, N.C. Four prestressed concrete roof girders 97 feet long and 4 feet 10 inches deep had to be lifted and set so precisely that wall ties could be placed in the beams.

For this exacting work, contractor F. D. MacDonald chose a Bucyrus-Erie 22-B Transit Crane equipped with a 40-ft. boom. This machine completed the job quickly and easily. Especially evident was its smooth operation . . . its ability to lift heavy loads and place them delicately.

Transit Cranes give you, as standard equipment, more of the features you need most — power controlled lowering of load line for delicate positioning of loads, friction swing brake for accurate spotting and holding of boom, independent power controlled lowering of boom suspension for changing boom lengths conveniently, open-throat boom design to permit rigging of multi-part lines, and extendible outriggers for added stability during swinging of capacity loads.

Two sizes available — the 15-ton Model 15-B and 25-ton Model 22-B. See your nearby Bucyrus-Erie distributor soon for full details.

213E56C

Bonus Quality

The steel, iron, and bronze castings used in Bucyrus-Erie machines and poured in the company's own foundries are laboratory controlled to the highest standards. Triple tests are run on every "heat" — such as the one being poured here — so that castings will possess the qualities which give long life and economical service on the job.

BUCYRUS ERIE

South Milwaukee, Wisconsin

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number. If blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Model 2 T Monighan dragline shop number 369, 75' boom; has practically new Caterpillar D-17000 diesel engine, new circle rails and rollers, swing segment gear, swing pinion and shaft and center pin bushing. Box 3699

SHOVELS—DRAGLINES
DRILLS
CRANES—EUCLIDS

625 Page Dragline, 170', 8 yd.
200-W Bucyrus Monighan Drag, 140', 6 yd.
621 Page Dragline, 135', 5 yd.
7200 Marion Diesel Drag, 120', 7 yd.
2400 Lima Dragline, 120', 6 yd.
4500 Manitowoc Dragline, 120', 5 yd.
618 Page Dragline, 110', 5 yd.
4-W Monighan Drag, 110', 4½ yd.
1055 P&H Dragline, 100', 3 yd.
54-B Bucyrus-Erie Drag, 90', 2½ yd.
1201 Lima Dragline, 85', 3 yd.
3500 Manitowoc Drag, 80', 2½ yd.
1001 Lima Drag, 80', 2½ yd.
190-B Bucyrus-Erie Elec. 8 yd. Shovel
170-B Bucyrus-Erie Elec. 6½ yd. Shovel
1600 P&H Elec. 6 yd. Shovel
2400 Lima 6 yd. Diesel Shovel
120-B Bucyrus-Erie Elec. 5 yd. Shovel
1055 P&H 4½ yd. Shovel
111-M Marion 4 yd. Shovel
1201 Lima Standard 3½ yd. Shovel
803 Lima 2½ yd. Shovel
80-D Northwest 2½ yd. Shovel
54-B Bucyrus-Erie 2½ yd. Shovel
38-B Bucyrus-Erie 1½ yd. Shovel
6 Northwest 1½ yd. Shovel
22-B Bucyrus-Erie ¾ yd. Shovel
802 Lima Cranes
58-BH Joy Champion Rotary Air Drills
600 Reich Heavy Truck Mounted Rotary Air Drill
Failing Rotary Drill
Quarrymaster Drill—with 2-500 cu. ft. Compressors
Also, 42-T, 29-T and 27-T Well Drills

EUCLID TRUCKS—Many to Choose

From

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

Bucyrus-Monighan Model 6160 Diesel Dragline 160' boom, several buckets 8 to 10 cubic yd. sizes. Base 36' diameter, engine Fairbanks-Morse diesel, separate Caterpillar engine for swing generator, approximately $50,000 worth of new and used parts.

One all-steel bulkheaded spud barge, 175' x 49', 6" x 11' deep, 3 drum hoist, ample fuel and water storage capacity, will clear all Mississippi River locks and meets U. S. Coast Guard requirements.

Will sell dragline alone or in combination with barge. Will not sell barge alone unless dragline has been sold.

For further details or inspection please reply to: Box 3704

Lima 2400 dragline equipped with 110' boom, two 7-yard Hendrix HS buckets, one 6-yard ESCO bucket, Kohler light plant; machine powered with Caterpillar D-397 diesel engine; 63" wide treads; long caterpillar frames; machine shipped September 1950; completely overhauled June 1955; engine completely overhauled April 1955; Approximately $5000 in spare parts available; Price, as is where is, $115,000. Box 3677

Bucyrus-Erie 110-B, all electric, 4½ yd. shovel. New 1955. In tip top condition. Located in Colorado, 100 miles S.W. of Denver.
Price, loaded $140,000

1055, P & H combination shovel and dragline, serial #14178, new 1951, equipped with shovel attachment and 120' dragline boom, fairleads and lagging. No dragline bucket, caterpillar engine. Shows little wear and is in good operating condition.
Price, F.O.B., Los Angeles ...$55,000

1055, P & H, dragline, new 1950, serial #12262. In Colorado, approximately 125 miles West of Denver.
Price, F.O.B., Colorado $34,500

Northwest 80 D shovel. New 1954. In tip top condition. Location Colorado.
Price $48,000

Northwest 80 diesel shovel, new in 1948. In good operating condition here in Los Angeles.
Price $26,500

Osgood model 800, 1½ yd. shovel. Serial #3205, powered by caterpillar D. 13,000 engine. Has not been overhauled but in good operating condition. Price, F.O.B., Oro Grande, Calif. $11,500

1½ yd. dragline attachment for the above Osgood shovel $2,500

NELSON EQUIPMENT CO.

430 S. Fuller Ave. Los Angeles 36, Calif.
Phone WEbster 1-4516

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Page 625 diesel dragline, S/N 242, new in 1951, has 150' boom and 9 yd. Page bucket; machine in A-1 condition; available now; located near Pittsburgh, Pa. Price $225,000. Box 3697

Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682

Page 620 dragline, S/N 165, new in 1943; has 120' boom and 5 yd. bucket; machine in good working condition, but idle since November 1955; located near Pittsburgh, Pa. Price $50,000. Box 3698

Manitowoc, 2000 B; 135' boom, 18' jib; powered by a Cummins diesel. $17,000
Loraine MC524 truck crane; 85' of boom, 25' jib, fairlead, tagline; new November 1953.
Model 160 pumpcrete with pipe.
Model 200 double pumpcrete.

BEASLEY-HOLMES COMPANY
3020 Reynolds Road FRanklin 1494
Toledo 6, Ohio

Bucyrus-Erie 22-B, Caterpillar D318 engine; machine used only part time; absolutely perfect throughout; must see to appreciate; ¾ yd. rock bucket; excellent undercarriage; financing available. Call or write Midland Machinery Co., Chillicothe, Mo. Phone 280.

LORAIN Model 77, 1½ cu. yd. shovel, Caterpillar D13000 engine, 16' dipper stick with bucket and 20' dipper stick with bucket, air crowd; operating condition; working every day. Located New York area.
Serial No. 5487 Price $7,500

H. O. PENN MACHINERY CO., INC.
140th St. & East River Bronx 54, New York

Type 460 Marion diesel electric shovel, S/N 5994, 1½ cu. yd., crawler mounted with Buda model 1139 diesel engine; this machine in Atlanta-Macon area. Box 3700

Insley ½ Yd. Machine with shovel front, Serial #K-3684.
F.O.B. Greensboro, N. C. $4,500
Northwest 25¾ Yd. Shovel with 24" treads and G.M. 3-71 Diesel Engine. New 1949.
Price F.O.B. Fletcher, N. C. $7,500
Allis-Chalmers TS-300 Motor Scraper with Buda Diesel Engine $12,000

E. F. CRAVEN COMPANY
Greensboro North Carolina

MANITOWOC MODEL 3500 STRIPPING SHOVEL, S/N 3602; equipped with 45' boom, 34' sticks and 2 cubic yd. dipper; powered with Caterpillar D-17000 diesel engine new in 1951; machine is in good operating condition. Price $35,000 as is, where is, and can be inspected at Sunnyhill Coal mine near New Lexington, Ohio. Box 3692

MISCELLANEOUS EQUIPMENT

Bucyrus-Erie 38-B standard 45' boom Serial 97955, complete with ropes and 20T single sheave swivel hook block and 6000# counterweight; practically new. Wire attention: W. J. Brooking

FOOTE MINERAL CO.
18 W. Chelton Ave. Philadelphia 44, Pa.

4—Bucyrus-Erie model 29-T blast hole drills, in good working condition; for further particulars contact Twin City Industrial Equipment Limited, 915 Memorial Ave., Port Arthur, Ontario, Canada.

Johnson concrete batching, mixing plant.
Ready-mix concrete plants, complete (2).
Placer dredges; tugboat; derrick boat.
Monighan Walker dragls. 9, 6, 5, 200W.
Colby hammerhead crane, 300', 14-ton.
Euclid trucks, 15-22 ton rear dump.
Shovels, cranes, dragls., 1½ to 18 yds.
Locomotives, diesel, gas, 15 to 100 tons.
S/L derricks, steel, 75, 35 and 20 tons.
Rotary kilns, dryers; 9x140, 6'x60', etc.
Diesel-elec. generators, 500 to 3500 KW.

H. Y. SMITH COMPANY
828 N. Broadway Milwaukee 2, Wis.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 van runner; spare liners. Box 3696

MISCELLANEOUS EQUIPMENT

2—Model 27-T Bucyrus-Erie blast hole drills, crawler mounted, chain and sprocket drive, equipped with telescopic derrick and built-in tool wrenches; powered by Int'l. gasoline motors, water cooled, 4-cylinders with twin disc clutch; with the following accessory equipment for 6⅝" drilling: combination and regular drill stems, wire rope sockets, drill bits and fishing tools; also one spare jack shaft completely installed, will fit either unit.
1—#8 Bucyrus-Erie bit dresser; complete without motor.
1—Coke furnace; with Champion electric blower.

All items are located at:

W. E. GRAHAM & SONS QUARRY
P. O. Box #4207 N. Sta.
Winston-Salem, N. C.

Ingersoll-Rand "Quarrymaster" No. 11629, Model QM-2; series KA-500 compressors; air-motor-driven hydraulic pump and valve unit for leveling; dust collection unit; utility air hoist; powered by Ingersoll-Rand diesel engines; 19" treads; 45' 11½" high tower; 40' steel 3¾"x2½" drill rods; 2"x3" joints API; 6" bits—approximate net weight 65,000#. FAUZIO BROTHERS, NESQUEHONING, PA.

1—Ingersoll-Rand, gasoline engine operated, Quarrymaster drill, model QM-2 equipped with 500 cu. ft. compressors; UL-83 regulators; 40' drill steel change; S/N 11697. Included are three 40' drill rods, 3¾" O.D.—⅝" wall, 2" x 3" A.P.I. threads for 6" bits; excellent condition. Priced as is near Pottsville, Pa. $25,000. Box 3695

MISCELLANEOUS EQUIPMENT

1—Bucyrus-Erie, 2-cu. yd. dipper complete with bail for a model 54-B high lift tubular stick shovel, in good condition.
1—Esco 2½-cu. yd. dipper complete with bail for a model 1201 Lima high lift shovel, in good condition.
1—Page RDH 2½-cu. yd. dragline bucket complete with chains, teeth, padlock and other hitch parts; all in good condition.

JOHN BOOTH, INC.
Phone 1400 Carbondale, Pa.

Shovel front end equipment for Bucyrus-Erie 37-B. Very good condition. Located at Hibbing, Minn. Box 3701

EQUIPMENT WANTED

LARGE ELECTRIC STRIPPING SHOVEL, 20 TO 35 CU. YD. CAPACITY. STATE AGE, SIZE, CONDITION, PRICE, LOCATION, WHEN AVAILABLE. PRINCIPALS ONLY. Box 3703

HELP WANTED

CONSTRUCTION EQUIPMENT SALES ENGINEER

Off highway haulage equipment department. Opportunity for sales engineer or construction man 30 to 35 years of age in established territory for AAA-1 construction distributor. Give full details of background and experience in first letter to

P. O. BOX 1705 Louisville, Ky.

Asphalt foreman or superintendent to take complete charge asphalt paving contract according to Ohio specifications, located Cleveland, Ohio; experience and references required.

ALSO

Mechanic for construction equipment, diesels, tractors, etc., must have own tools; experience and references.

TESTA BROTHERS, INC.
Richmond Road Bedford, Ohio

POSITIONS WANTED

Superintendent available; 30 yrs. experience and qualifications covering all types of sewers, water lines, highways, airports, heavy and light excavating, earth fill dams; know cost, plans and specifications, materials, labor and modern equipment; honest, sober and reliable; best of health and a pusher; available for any part of the U.S.A. Box 3702

J. P. WAITE, INC.

3304 West Pierce St. Milwaukee 15, Wis.

"YOUR USED EQUIPMENT HEADQUARTERS"

NEED ADDITIONAL EQUIPMENT??? . . .
NOT QUITE ENOUGH EXTRA WORK TO WARRANT NEW??? . . .
YET TOO MUCH WORK FOR COSTLY RENTAL??? . . .

Let us show you our complete line of used equipment—

CRANES—SHOVELS—DRAGLINES—BACKHOES

Rubber and crawler mounted

Call EVergreen 4-1900 or stop at Waite yard, 3304 West Pierce St., Milwaukee.

USED EXCAVATOR EQUIPMENT
TRADE-INS

¾-yd. SHOVEL—Model 22-B Bucyrus-Erie, completely overhauled. Cat D-318 diesel power, standard crawlers, ¾-yd. dipper—excellent condition.

1-yd. SHOVEL—Model LS-90 Link-Belt Speeder, Waukesha gas engine, used very little, 1-yd. dipper—like new condition.

¾-yd. CRANE—HEAVY DUTY Clamshell Combination, Model 40 General, Buda gas engine, excellent condition, recently completely rebuilt.

2-yd. CRANE—Clamshell Combination, Model 820 Lorain, 90-ft. boom, fairlead, 2-yd. dragline bucket, Cat diesel power—excellent condition.

½-yd. DRAGSHOVEL, Model 15-B Bucyrus-Erie, New 1952, Cat D-315 diesel power, long frames, 20-in. crawlers, ½-yd. Hoe dipper—good condition.

⅜-yd. HOE-SHOVEL on rubber, Quickway Model "J," very good condition, priced right.

½-yd. UNIT CRANE, clamshell, 45-ft. boom, tagline reel, ½-yd. Owen clamshell bucket, good condition.

½-yd. UNIT CRANE, clam combination on rubber, self-propelled wagon type carrier, ½-yd. type "M" Owen clamshell bucket, completely overhauled.

H-2 HYDROCRANE—3-pump set-up, new valve banks; mounted on 1947 Chevrolet truck, repacked—good condition.

H-2 HYDROCRANE—3 pumps, late model, tagline reel; mounted on 1949 KB5 IHC truck.

H-3 HYDROCRANE—with magnet equipment; mounted on IHC 160 truck, very good condition—priced to sell.

¾-yd. DRAGSHOVEL, Model "L" Insley, D-315 Cat diesel power, independent boom hoist, 3 years old—good condition.

¾-yd. DRAGSHOVEL, Model "L" Insley, 425 Minneapolis Moline power, 30-in. crawlers, 3 years old—good condition.

⅜-yd. DRAGSHOVEL, Model 10-B Bucyrus-Erie, Buda gas engine, like-new crawlers, rebuilt dipper, good working condition.

OPTIONAL ATTACHMENTS OF YOUR CHOICE AVAILABLE ON ABOVE EQUIPMENT

GOOD BUYS PRICED RIGHT

"CHECK WITH US BEFORE YOU BUY"

All equipment offered subject to prior sale.

There's only one GYRO-FLO

GYRO-FLO Compressors and I-R Wagon Drills on a throughway construction job. More compressors and drills on another section of same highway are shown below.

EVER SINCE 1950, when the sensational GYRO-FLO portable rotary compressor was first introduced, there has developed an ever-growing trend to rotary design.

Yet the GYRO-FLO still remains years ahead in advanced design and proved performance. On job after job, thousands of units in all five sizes have established an unmatched record for dependability, economy and remarkable freedom from maintenance.

In the past six years, still further features have been added so that when you purchase a GYRO-FLO portable compressor, you are getting today's most economical air-power.

There is only one GYRO-FLO—and Ingersoll-Rand has made it since 1950.

Ingersoll-Rand, 11 Broadway, New York 4, New York.

2-323

Ingersoll-Rand's Portable Rotary Compressor

Introduced in 1950

Available in 125, 210, 315, 600 and 900 cfm sizes.

AN UNBEATABLE COMBINATION—GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

"3 REASONS WHY WE USE CAT* ENGINES:

1 All the power we need to do the job easily.

2 Maximum dependability with minimum good care.

3 Operators prefer Cat power to work with."

NELSON ARMSTRONG, *Supt.*
Maxwell Bridge Co.

Those three reasons tell why Maxwell Bridge Co., of Columbus, Kansas, powers its cranes and excavators with Caterpillar Diesel Engines. The Koehring Crane shown here, placing I-beams for a bridge 5 miles west of Emporia, is one of 12 machines owned by Maxwell. Its engine? A Caterpillar D318, with well over 4000 hours on the meter.

Operators who have worked for this company from 8 to 25 years are particular about their power. Busy all year around, each man services his own machine. Naturally they want an engine that stays on the job without tinkering—and when they're asked to name their preference, they choose Caterpillar.

Most manufacturers of excavating equipment can supply Cat Diesels as original power. Or Caterpillar Dealers are ready to install these dependable engines as replacement power. A full line of engines is available. The D318, for example, is rated at 137 HP (maximum) at 2000 RPM.

For the power you need and for service and parts you can trust, call your Caterpillar Dealer. He's as near as your telephone.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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MODERN HEAVY-DUTY DIESEL ENGINES